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May 1956

THE MAGAZINE OF

Appliance AND Metal Products MANUFACTURING

FROM RAW METAL TO FINISHED PRODUCT

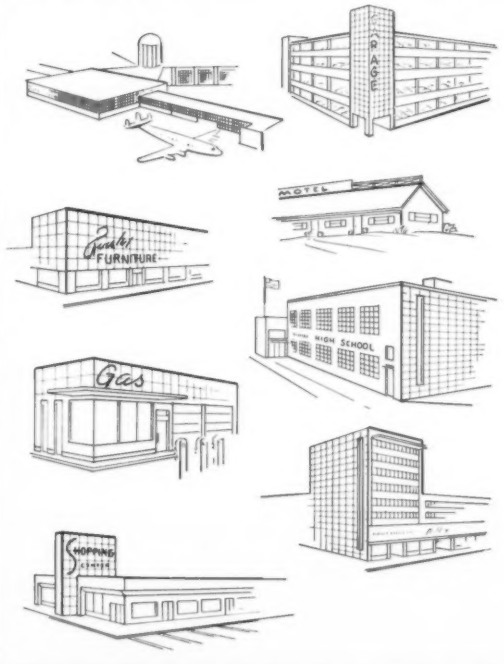
to face the elements
and the
future

PORCELAIN ENAMEL—
"Ceramic"
COLORS

for architectural panels

"Ceramic" was an important supplier of color for architectural porcelain enamel in the early days, when filling stations furnished the only market. Since then porcelain enamel panels have come into their own as an important factor in architectural design; recognized for their structural economy, diversity of color, versatility of application, and easy maintenance.

Leading manufacturers have continued to depend on "Ceramic" for colors that smooth production problems and can be relied on for precise color matching and continued uniformity.



CERAMIC COLORS

CERAMIC COLOR & CHEMICAL MFG. CO.
New Brighton, Pa., U.S.A.

Gyratator shaft collar, pump shafts, crank collar, shoe and collar pins, all made of Armco 12FM Stainless Steel Bar stock.

How Armco STAINLESS STEEL BARS give laundry equipment **Balanced Design**

Here's how one leading manufacturer of washers and dryers achieved "balanced design" . . . solved the problem of premature failure of vital parts:

Specifications were changed from carbon steel bars to Armco 12 FM (Type 416) Stainless Steel bars for key parts. These include pins and collars for brake components, pump shafts, gyratator units, housing and tub pins, hinge brackets and pressure switches. Good corrosion resistance and strength of this special steel help insure trouble-free service for the life of the appliances.

For Your Products?

You, too, can gain "balanced design" in your appliances with Armco Stainless Steel. Changing to this durable metal for vital parts can give you extra sales points, help assure satisfied customers and dealers. There's a grade of Armco Stainless Steel for every tough job.

Our engineers will be glad to work with you in a part-by-part study of your appliances. Just fill in and mail the coupon for more information on Armco Stainless Steels.

ARMCO STEEL CORPORATION
1256 Curtis Street, Middletown, Ohio

I am interested in Armco Stainless Steels. Send me your catalog.

We manufacture_____

Name_____

Title_____

Company_____

Street_____

City_____ Zone____ State_____

ARMCO STEEL CORPORATION

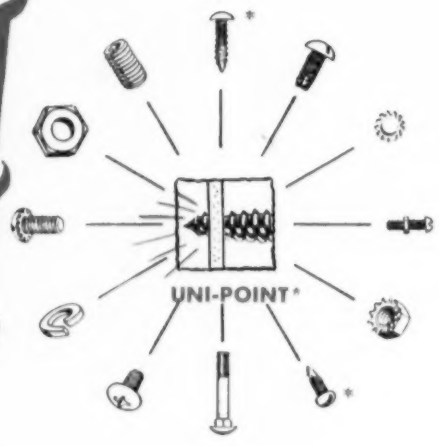
1256 CURTIS STREET, MIDDLETOWN, OHIO

ARMCO®

SHEFFIELD STEEL DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

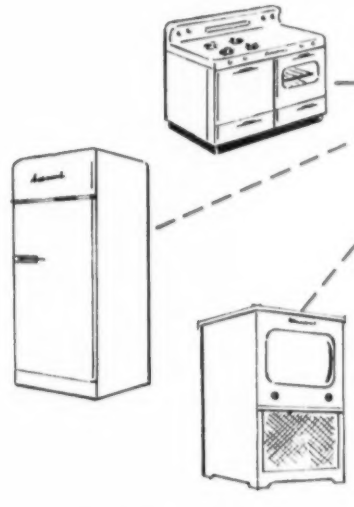
Universal Screws

ARE USED BY THE NATION'S LEADING APPLIANCE MANUFACTURERS



Appliance manufacturers everywhere know that precision components help build quality products. That's why so many of these progressive companies use Universal screws and fasteners for a variety of needs.

AMONG THEM ARE SUCH TOP NAMES AS



Admiral

In the home appliance field one of the most respected names is Admiral . . . respected for the high standard of quality built into every one of its products. That's why we're proud to count Admiral among the many users of Universal screws and fasteners.

*Pat. Pend.

UNI-POINT* is an exclusive new development by

UNIVERSAL SCREW COMPANY

MANUFACTURERS

precision quality fasteners for the appliance industry

127 S. Green St., Chicago 7 Illinois — SEeley 8-3383, Teletype CG1767

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finish

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A trade publication devoted to the interests of the metal products manufacturing industry with special editorial attention to home appliances. The editorial scope covers design, engineering, market and statistical information and technical and practical information on plant facilities and all phases of manufacturing "from raw metal to finished product."

Free controlled circulation to top management, purchasing, engineering and key plant management and supervision in metal product manufacturing plants. To others, subscription price is $5.00 per year, domestic. To all other countries $8.00 per year (U.S. funds).

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METAL PRODUCTS MANUFACTURING
FROM RAW METAL TO FINISHED PRODUCT

LORD HALL LIBRARY

Published in the interest of the Soft Drink Canners Association and the canning industry.

No headaches in these drinks!

Eliminate the hazard of broken bottles in your plant by providing your employees the safety and convenience of canned soft drinks.

Call your soft drink supplier and learn the many advantages of dispensing drinks the modern way—in cans.

QUALITY YOUNGSTOWN SERVICE

Above are illustrated two of the modern cans for soft drinks, now available for in-plant use.

THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon, Alloy and Yoloy Steel*

General Offices Youngstown, Ohio District Sales Offices in Principal Cities.

SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - BLACK PLATE - RAILROAD TRACK SPIKES - MINE ROOF BOLTS

Aluminum, Alodized with Architectural Alodine,® needs no painting, retains its finish for life.

Alodizing with Architectural Alodine — a revolutionary new chemical process which converts aluminum surfaces to an amorphous phosphate — adds years to the already long life of aluminum. It produces colors ranging from a gray-green to a deep green resembling the patina of aged copper, requires no painting, retains its new look for life. In addition, it cuts reflectivity 30% or more, and is much less expensive to use than the more complex anodizing process. Ask for Bulletin 1366 —it gives complete information.

Aluminum Awning Manufacturer finds Alodizing with Alodine 2 times as fast, 4 times as efficient

Previous process needed more time, and finish was too brittle for roll forming. Alodizing with Alodine has had a twofold production benefit: it has cut operating costs about two-thirds and has increased output 50%. And the Alodine amorphous phosphate coating forms such a durable and tenacious bond that roll forming of the slats after the enamel has dried does not damage the finish. We can offer the same product advantages to you. Ask for Bulletin 1241A.

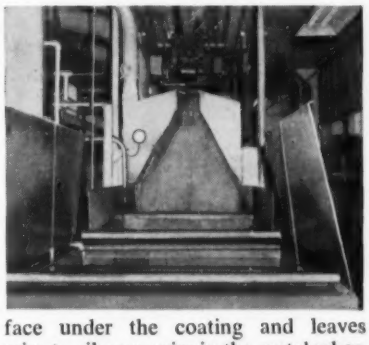
Granodine® Coating Inhibits Rust Anchors Finish on Food Freezers

This phosphate coating not only provides a constant barrier against rust, but it affords a positive means of anchoring the paint finish to the metal. Granodizing with Granodine offers

another advantage, too — it prevents the spread of rust when the finish is accidentally chipped or scratched. Ask for Bulletin 915A.

Thermoil-Granodine Cuts Friction 60% Combats Scuffing and Cylinder Scoring, Speeds Seating of Piston Ring Sets

This inexpensive and practical method of preventing metal-to-metal contact reduces friction up to 60% by giving the rings an iron manganese phosphate surface. Also it lengthens life and speeds the normal seating time of the rings. It is corrosion resistant and rustproof, too. These advantages are largely due to the lubricant-adsorbing characteristics of the Thermoil-Granodine surface. But they are also explained by the etching effect of the solution which produces a porous sur-



face under the coating and leaves minute oil reservoirs in the metal when all traces of the coating have disappeared. Ask for Bulletin 915A.

Granodraw® Coating Facilitates Cold Forming and Extrusion, Improves Drawing, and Lengthens Die Life

Granodraw is a zinc phosphate coating used with suitable lubricant to facilitate the cold mechanical deformation of carbon steels. Typical applications include tube drawing operations, cold forming of blanks, shells, and heavy stampings. Another ACP product, Granodraw SS, is designed for the treatment of stainless steels. Ask for Bulletin 915A.

Rodine® Cuts Pickling Costs

These pickling-acid inhibitors retard the attack of the acid on the metal without affecting its ability to remove scale. In straight-line pickling of wire, rod and tube, Rodine makes available more metal for drawing. In batch pickling, it improves the surface. In continuous strip pickling, it prevents overpickling during line shutdowns. Wherever used, Rodine saves acid and metal. Ask for Bulletin 270B.

You, too, can cut costs, increase production, add years to your product's life with these ACP Chemicals and Processes

And still another advantage to users of these ACP chemicals and processes is offered by ACP. Its Engineering Department will help in the development of the process and process equipment. Its Service Department will make periodic inspection of the process in operation and the equipment. Its Quality Control Laboratories will run tests of finished coupons. All are free of charge.

CHEMICALS ACP PROCESSES

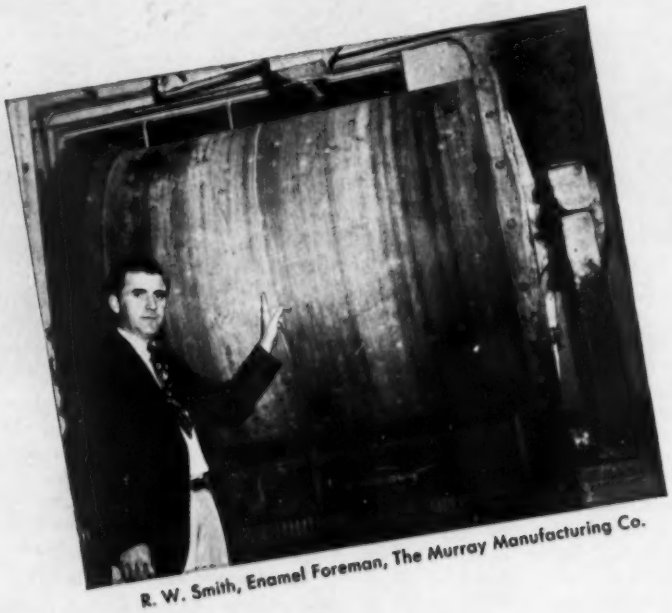
AMERICAN CHEMICAL PAINT COMPANY

Ambler 33, Pa.

Detroit, Mich. • Niles, Calif. • Windsor, Ont.

Coors high density grinding balls produce these results...

"GRINDING TIME CUT TO 4½ HOURS"



R. W. Smith, Enamel Foreman, The Murray Manufacturing Co.

"NEED FOR ADDITIONAL MILLS WAS ELIMINATED"

"MILLED ENAMEL COMES OFF COOLER"

"NO BALLS HAVE TO BE ADDED WITH EACH BATCH"

"NO BALLS ARE SCRAPPED FOR BEING OUT OF ROUND"

"LINING WEAR IS LESS"

"AFTER 2½ YEARS OF OPERATION WITH COORS BALLS, WE ARE CERTAINLY PLEASED"

See our catalog in "Ceramic Data Book" page 113

The Murray Manufacturing Co. says:

"We began using Coors High Density Alumina Ceramic Grinding Balls at a time when we were considering additional mills to take care of our schedule.

"With the Coors High Density Grinding Balls, we were able to cut our grinding time from between 7 and 8 hours to 4½ hours on the 1,000 pound mills. We were able to meet our schedule without adding mill room equipment, and still have idle time on our mills. We had cut milling time 40%.

"Maintenance cost on mills went down, because we eliminated the extra grinding time. We did not have the excessive amount of unground frit. Milled enamel came off cooler, and we were able to obtain a more uniform set. No balls are added with each charge. Mills are now dumped once a year (we had to dump conventional charges every 35 grinds and scrap around 300 lbs. from being out of round, broken, etc.). We dump now only to inspect linings. No Coors Balls are scrapped as they wear even and are still in good shape.

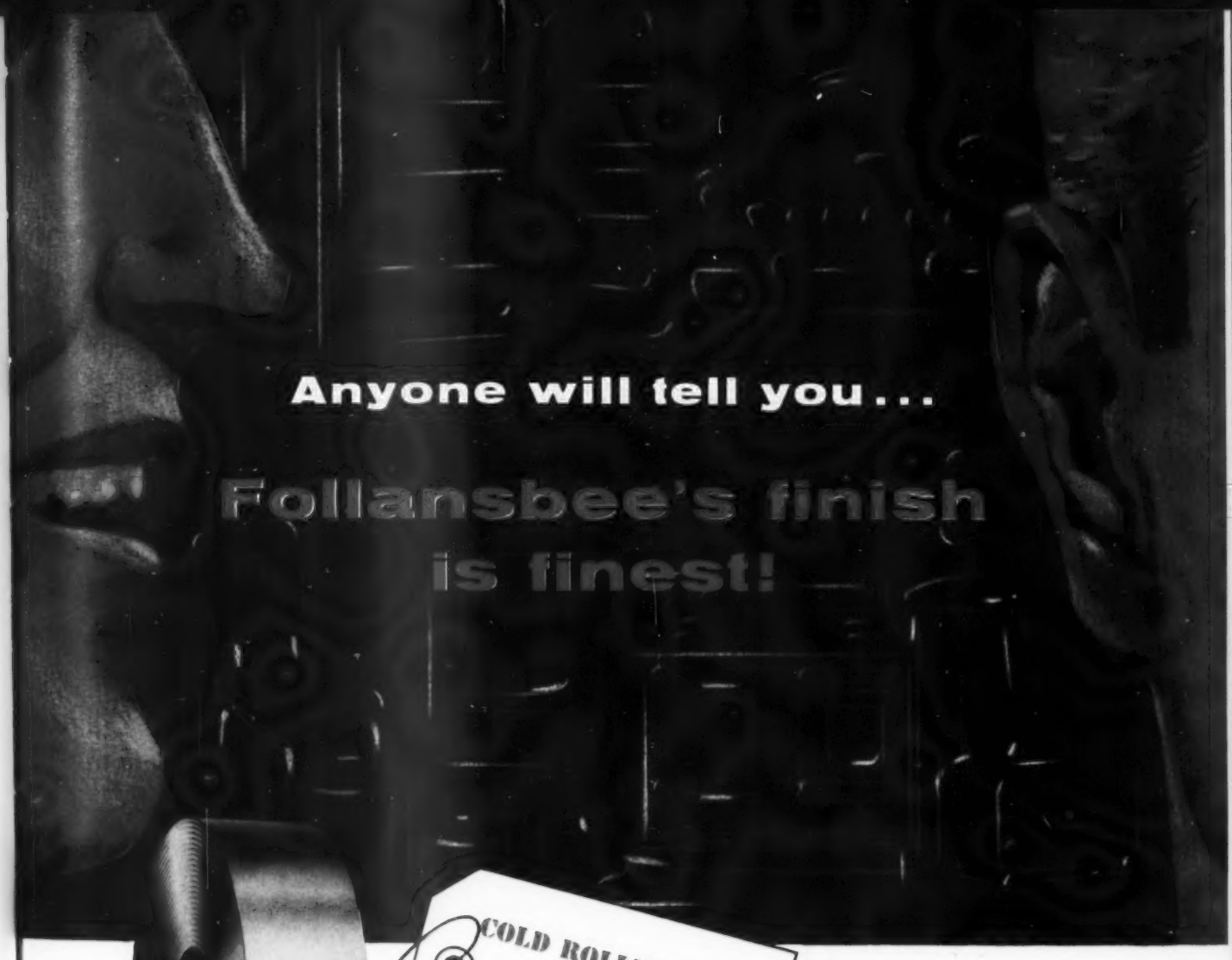
"We do not have Coors High Density Linings in our mills at present, but with the conventional lining, wear is less than with other balls over a year of the same amount of slip milled.

"After 2½ years of operation with Coors High Density Balls, we are proud to express our opinion on a product which has done so much for us," R. W. Smith, Enamel Foreman, The Murray Manufacturing Co.

COORS PORCELAIN COMPANY
Golden, Colorado

National Sales Representatives . . .
LZP INDUSTRIAL CERAMICS CO.,
2500 West 7th Ave., Denver 4, Colo.

Write today for your copy of our new handbook on "Coors High Density Grinding Media and Mill Lining Brick of Alumina Ceramic."



Rigid quality control through every phase of production at Follansbee produces a finish that has earned the reputation of the finest in the industry. Follansbee mill operators take pride not only in meeting your exact specifications but also in giving you cold rolled strip that has consistent uniformity.

Get in touch with your Follansbee representative before you place your next order for strip. He's anxious to show you what true quality and unmatched service can do for you and your product.

FOLLANSBEE

STEEL CORPORATION

FOLLANSBEE, WEST VIRGINIA

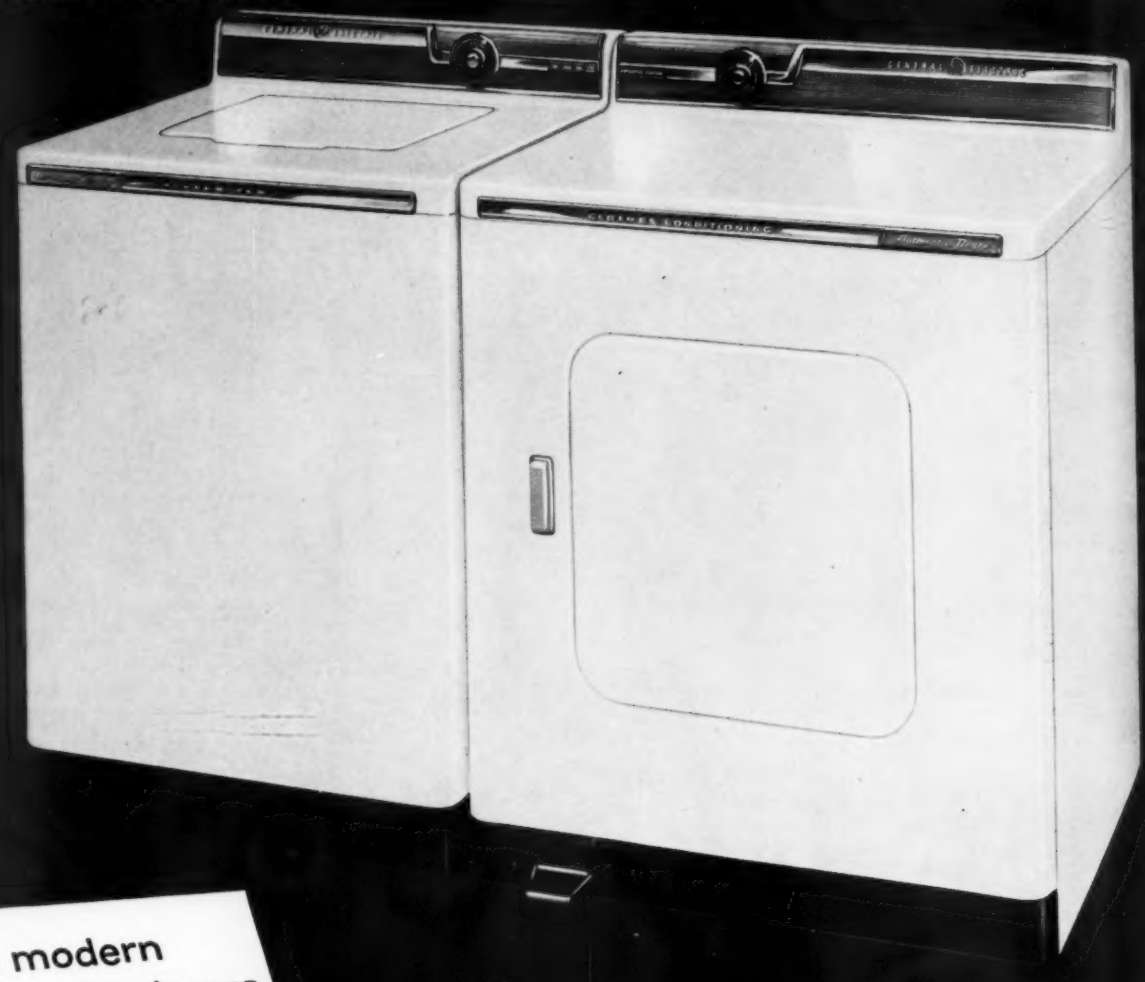
Cold Rolled Strip • Terne Roll Roofing • Polished Blue Sheets and Coils

Sales Offices in Principal Cities

Progress Is Our Most Important Product

GENERAL ELECTRIC

New G-E Washer and Dryer give you cleaner, brighter clothes—no lint fuzz



On modern washers and dryers

DULUX® Enamel finishes first in sales appeal...resistance to marring

DU PONT
REG. U.S. PAT. OFF.

"DULUX" ENAMEL

Better Things for Better Living . . . through Chemistry

America's leading home-appliance finish

Over 53,000,000 major home-appliance units now in service are finished with Du Pont DULUX Enamel.

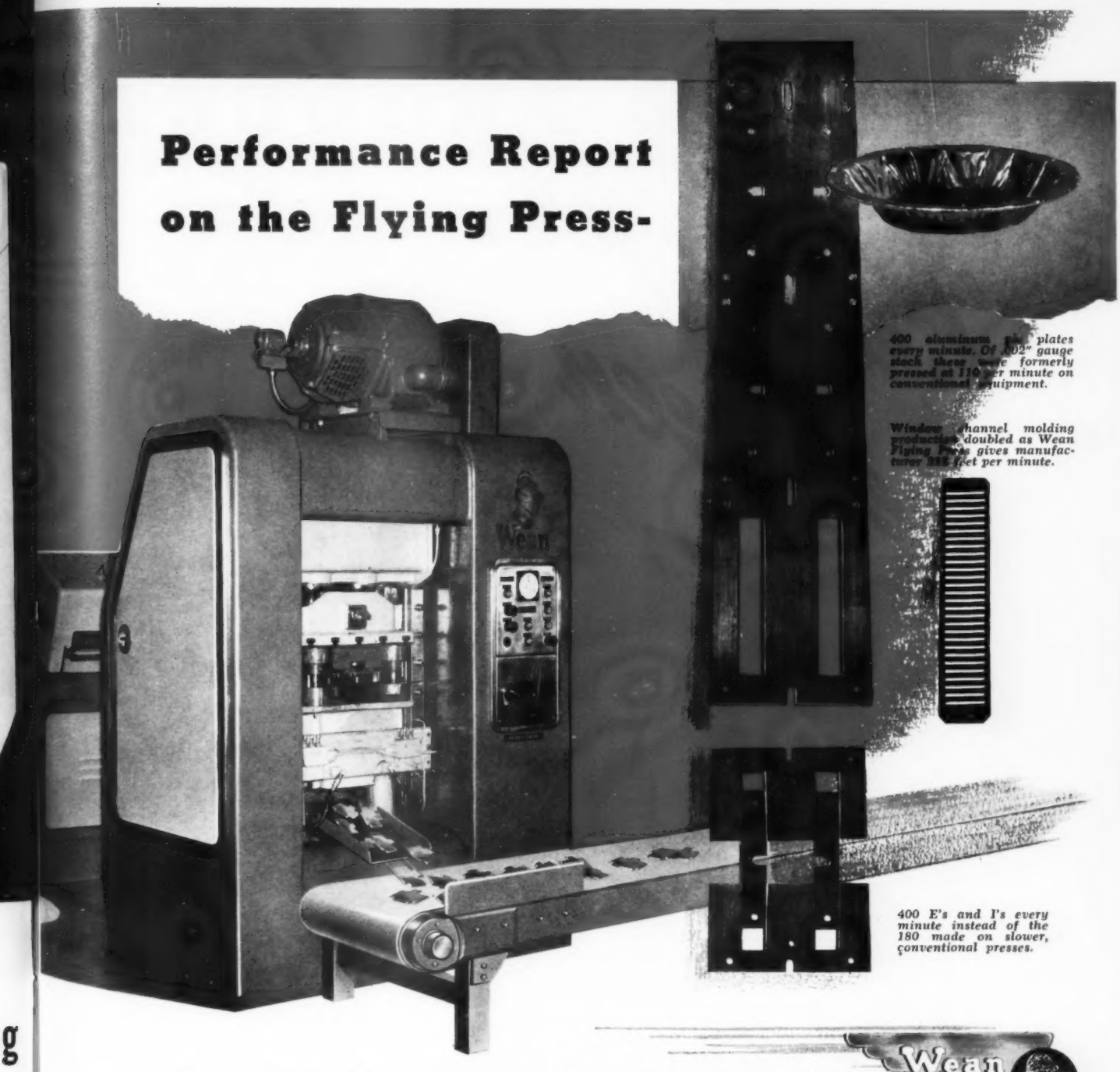
AN APPLIANCE FINISH that dependably resists harmful effects of soaps, detergents and heat naturally gives modern washers and dryers added sales appeal. And that's only *one* of the sales-winning properties of durable Du Pont DULUX Enamel.

Constant research by Du Pont chemists has resulted in a finish that ruggedly resists chipping, cracking, scratching and staining. Application costs are lower with DULUX without sacrifice of quality appearance or performance.

DULUX keeps its first-day new look even after years of use in the home. Its longer-lasting whiteness, resistance to wear and easy cleanability help insure the continued customer satisfaction that's so important to the success of any appliance line. No wonder so many of today's topflight appliance manufacturers use Du Pont DULUX Finishes.

E. I. du Pont de Nemours & Co. (Inc.), Finishes Div., Wilmington 98, Del.

Performance Report on the Flying Press-



400 aluminum [illegible] plates every minute. Of .032" gauge stock these were formerly pressed at 110 per minute on conventional equipment.

Window channel molding production doubled as Wean Flying Press gives manufacturer 315 feet per minute.

400 E's and I's every minute instead of the 180 made on slower, conventional presses.

Revolutionary Wean Press continues to amaze the industry

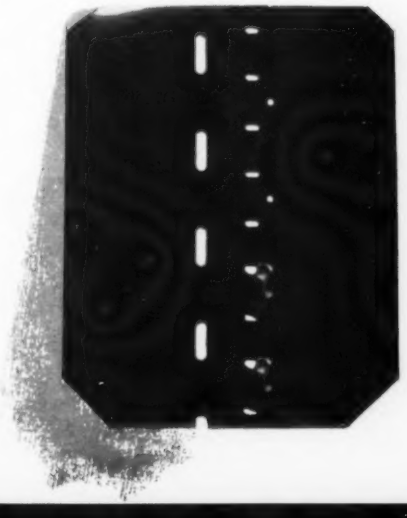
Wean FLYING PRESS

Since it was first introduced to industry, the Wean Flying Press has commanded the interest of imaginative production people.

On paper, it looked good. Tests on the hand made prototype were even more convincing. But, could a production model achieve such levels under actual operating conditions?

For the answer—note the typical production figures set down here. In every case, the Wean Flying Press, using standard die sets, has established a performance record.

Why not acquaint yourself with this amazing press now? Contact the Wean Sales-Engineer in your area or write direct.



Shallow draw and punch work on .065 gauge stock boosted to 400 pieces per minute by Wean Flying Press.

Wean

EQUIPMENT CORPORATION

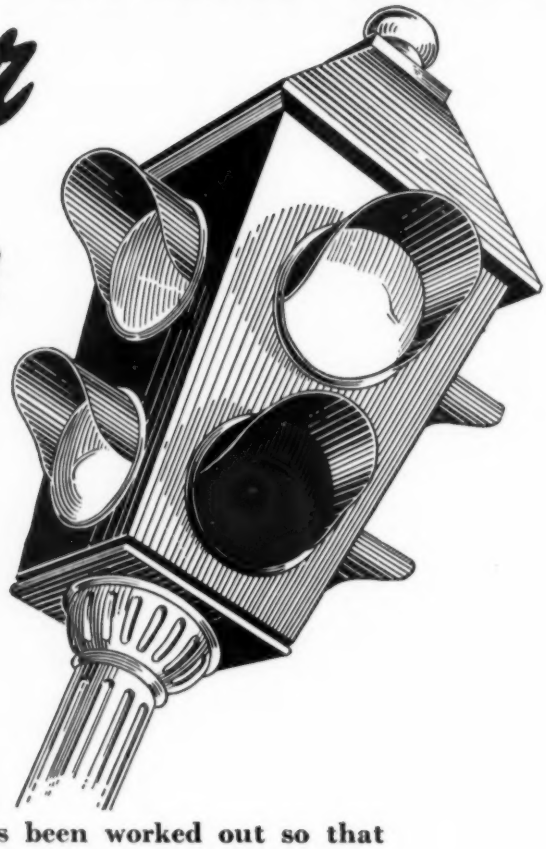
CLEVELAND • CHICAGO • DETROIT • NEWARK, N. J.

Cable: WEANCOR

9935

IS YOUR PRODUCT

Ready for the green light



Have all the kinks been worked out so that your black iron shapes enamel most satisfactorily and economically?

Have you checked enough enameled samples so that you know just what colors and types of enamel are most suitable?

For over 25 years we have been helping in the development of many varied porcelain enameled parts.

VITREO

Use this experience *now*. Then you will be ready to swing right into production at the earliest possible moment.

VITREOUS STEEL PRODUCTS CO.

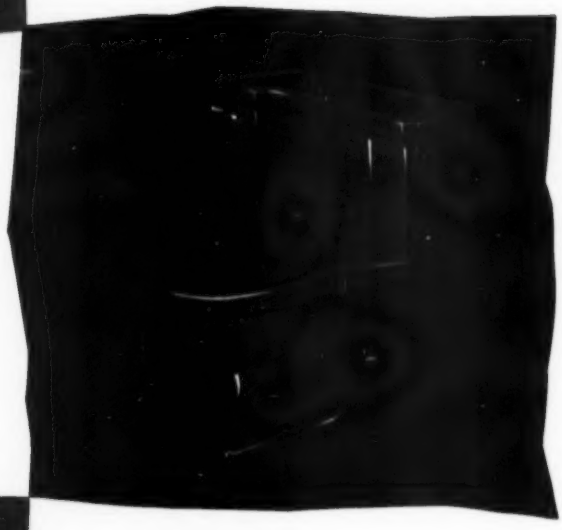
BOX 3991 • CLEVELAND 20, OHIO (Factory at Nappanee, Indiana)

THE finish spotlight

The accent's on color in Hobart's new KitchenAid dishwasher. From the sharp clean sparkle of stainless through the rainbow of color, into coppertone and white, the variety of colors available offer the beauty of interior decor styling with the latest technological advancements in engineered ease for the homemaker.

Colors...

that really match!



Plumbing fixtures produced by different ceramic processes *can* be color-matched perfectly with Ferro colors. Experienced technicians working in the industry's most modern and completely equipped color laboratory now take all the "guesswork" out of color problems. Why not put them to work for *you*?

FERRO

FERRO CORPORATION

Color Division

4150 East 56th St. • Cleveland 5, Ohio

CANADA: Ferro (Canada) Ltd., Oakville, Ont.

Check Ferro 7057 for Porcelain Enamel Engineering, Equipment and Furnaces, Frits and Colors, Mill Additions and Supplies!

from the Editor's Mail

Catalytic combustion

Gentlemen: We are highly complimented by the fine presentation in your April issue. The generous size of the cuts . . . exceed our fondest expectations. You people certainly have a way of leading the field when it comes to "character in print" . . .

P. H. Goodell
Sales Manager
Catalytic Combustion Corporation
Detroit, Michigan

Thank you for your kind words. In return, we appreciate the opportunity of publishing material of such character as the article "Catalytic Combustion for Industrial Ovens", (April, *finish*, p. 25) which you so graciously prepared for us. Eds.

reader from South Africa to visit U. S.

Gentlemen: As regular subscribers to your journal which we read with very great interest and we are also very happy to say has also at various times given us some very useful information.

We are manufacturers of electric plug-in stoves, pressure cookers and steel kitchen units, etc., and in this connection one of our directors, Mr. Soller, will be arriving in New York on the 26th of this month. (March)

Mr. Soller's American address will be, c/o Anglo African Shipping Co., 16 East 34th Street, New York, and Mr. Soller will be contacting you regarding sources of supply of various items and we trust that you will be able to put him in contact with suppliers.

A. M. Meyers
Director
Rulex Industries, Ltd.
Johannesburg, South Africa

A cordial welcome to you, Mr. Soller. We are at your service. Eds.

interested in gold finish

Gentlemen: We notice in the March issue of your magazine, on page 50 which displays the 20 Millionth Frigidaire finished in gold.

We are interested in this particular finish of gold for one of our products which will be out this summer marking our 2 Millionth piece.

We would appreciate you advising us on this particular finish and where same can be purchased. We understand it has a sparkle appearance.

Edward S. Goldberg
Vice Pres. & Director of Purchases
The Bunting Company, Inc.
Philadelphia, Penna.

Your request has been forwarded to Frigidaire Div., General Motors Corp., Dayton, Ohio.

Alcoa R-100 process

Gentlemen: We noted under "New Industry Developments" in your February issue of *finish* an article written on Alcoa's R-100 Process (pre-enameling process for aluminum) and we would appreciate any further information you can provide on this method . . .

Frank J. Halapin
President
Halrick, Incorporated
Danbury, Connecticut

To assure your receiving the most up-to-date information we have forwarded your request to Aluminum Co. of America. Eds.

magazine very informative

Gentlemen: I have reviewed several issues of *finish* with great interest. I find it a very well organized magazine as well as being very informative. I compliment you on a very fine publication.

I should like very much for you to consider me for your mailing list for *finish*. I am sure it would be of great value to me and my department.

Arnold D. Moskowitz
Supervisor, Time Study & Methods
Progress Mfg. Company, Inc.
Philadelphia, Penna.

Mr. Moskowitz has been added to our mailing list. Eds.

parallel in growth

Gentlemen: I have just returned after spending a month in Florida, and this is the first opportunity that I had to read the article which you published in your March issue of *finish*.

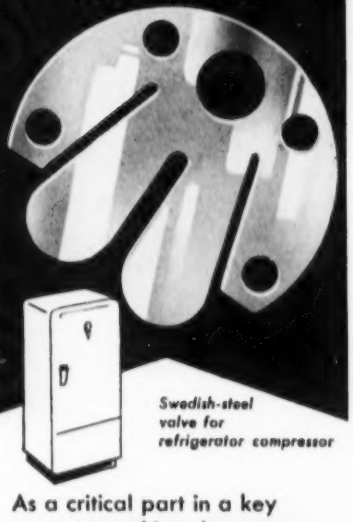
I want to compliment you on this wonderful article. It certainly is complete and does our plant justice. I know that your readers will enjoy reading same.

I cannot help but remember the first issue of *finish* in January, 1944, when you had an article on our plant, and certainly a great deal of change has taken place over these last ten years. I also remember the struggle that you had in issuing your first magazine and the continued growth that your publication has shown over these last ten years certainly proves that it is one of the best publications on top of my desk. It certainly has proven beneficial to our personnel over these last ten years and this is the reason for your continued growth. It is a wonderful magazine.

Nathan Klein
Chairman of the Board
Caloric Appliance Corp.
Topton, Penna.

finish thanks Mr. Klein for the place of prominence atop his desk. The comments about the Caloric story in March and the remarks concerning the magazine's growth seem parallel to us, for they line together—proving that objective writing and a constant and growing desire to provide the best and the most accurate data in every story are the only ways to progress. We thank Caloric's chairman for his comments. Moreover, our thanks for his support which has been a part in making *finish* the magazine of the appliance and metal products industry. Eds.

When the reputation of your product depends on critical stampings like this...



Swedish-steel valve for refrigerator compressor

As a critical part in a key component, this valve must perform flawlessly for years.

If not, the reputation of a leading refrigerator would be at stake.

That we are the world leader in such parts, may merit similar critical assignments from you.

A brochure is yours for the asking!

DE-STA-CO

DETROIT STAMPING COMPANY

Established 1915

404 Midland Ave., Detroit 3, Mich.

"America's Leading Job Stamping Manufacturer"

Look to DETROIT!

NOW...SPRAYED... AIR-DRIED... LOADED... in MINUTES instead of HOURS!

Dale Kennedy, Chief Engineer for Powell Pressed Steel Co., inspects miniature models of materials handling equipment for which new timesaving finishes were developed.

Fast-drying Sherwin-Williams finish helps solve storage space problem

What do you do when the storage space needed for air-drying finished products starts to crowd out production space? One solution, of course, is to build more plant space. Powell Pressed Steel Co., Hubbard, Ohio, found a faster, more practical answer by close teamwork with Sherwin-Williams Industrial Finish Specialists. A new, faster drying finish was developed to meet the requirements for resistance to exterior exposure, machine oils and general rough usage.

Tested and adopted, the new finish solves the problems of storing bulky steel boxes after finishing . . . permits loading almost directly, after spraying, into railroad cars for shipment. Where drying formerly required 4 to 8 hours, boxes now are loaded after as short a period as 4 to 8 *minutes* after spraying!

Industry-wide experience in product finishes enables Sherwin-Williams to offer similar help on many related problems of engineering, production or sales. Investigate—without obligation—today! Write The Sherwin-Williams Co., General Industrial Division, Cleveland 1, Ohio.

COVER THE EARTH

SHERWIN-WILLIAMS

INDUSTRIAL FINISHES

Products of SHERWIN-WILLIAMS INDUSTRIAL RESEARCH

COVER THE EARTH

When you demand high uniform quality, *you use Bonderite under the paint.*

PROTECTED BY Bonderite PARKER RUST PROOF CO. QUALITY CORROSION RESISTANT

SEAL WITH A MEANING

The red and silver Bonderite seal on your products will tell buyers, "This Product Will Look Better Longer," 25 years of national advertising backs up this seal. Write to find out how you can cash in on it.

● When you see the smooth, tight-grained, uniform Bonderite coating move past the inspection station, you know your final paint film will be smooth, even and lustrous.

There's another point to mention here. As production men know, when inspection finds high uniform quality on the paint line, there'll be mighty few field refinishing costs to bite into profits.

High uniform quality is just one of the advantages Bonderite delivers. Let us tell you the rest of the story. Write or call today.

**Bonderite, Bonderlube, Parco, Parco Lubrite, Parker Pre-Namel—Reg. U.S. Pat. Off.*

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Since 1914 — leader in the field

BONDERITE	BONDERITE and BONDERLUBE	PARCO COMPOUND	PARCO LUBRITE	TROPICAL
corrosion resistant paint base	aids in cold forming of metals	rust resistant	wear resistant for friction surfaces	heavy duty maintenance paints since 1883

AT THE HUB OF INDUSTRY IN THE HEART OF AMERICA

Here at Fahralloy we believe in giving service as well as manufacturing top quality heat and corrosion resisting castings. In fact, service is a keystone upon which our business has grown over almost a quarter of a century. Sitting here at the hub of industry in the heart of America we're never more than a few hours away from you at most. No matter what your problem may be if a heat and corrosion resisting casting is involved, you'll find the solution at Fahralloy. Try us and see for yourself.

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Century Vit Titanium cover coat over Century Vit ground coat are an unbeatable combination for adding durability and beauty to your product.

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WITH DETREX Paintbond®

Detrex Paintbond provides positive anchorage for your paint finish . . . permanently locking the paint to the metal. Paintbond is a zinc phosphate coating which chemically interlocks with the metal surface, providing the ideal base for paint finish.

Your product will have *more sales appeal* when you use Paintbond because of these features.

1 It completely seals metal surface from moisture and other causes of corrosion.
2 It retards corrosion if the finish is scratched.
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4 It improves product appearance . . . smoother surface, more lustrous paint finish.

Detrex Paintbond will save you money, too! It coats a larger surface area per drum—or will give you a heavier coating with the same amount of compound. You also have greater control of coating weight and crystal size. Mail the coupon for complete information.

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MEETINGS

APPLIANCE INST. MEETING

Institute of Appliance Manufacturers 24th Annual Convention and Exhibit, Netherland Plaza, Cincinnati, June 4-6.

APPLIANCE TECHNICAL CONFERENCE

American Institute of Electrical Engineers, 7th Annual Appliance Technical Conference, Wisconsin Hotel, Milwaukee, May 14 - 15.

ASME MEETING

The American Society of Mechanical Engineers, semi-annual meeting, Statler Hotel, Cleveland, June 17-21.

AWS WELDING SHOW

American Welding Society, annual welding show, Memorial Auditorium, Buffalo, N. Y., May 7-11.

DESIGN ENGINEERING CONFERENCE & SHOW

American Society of Mechanical Engineers, Design Engineering Conference, held concurrently with Design Engineering Show, Convention Hall, Philadelphia, May 14-17.

ELECTROPLATERS' CONVENTION

American Electroplaters' Society, 43rd Annual Convention, Hotel Statler, Washington, D.C., June 17-21.

ENAMELERS CLUB MEETINGS

Central District Enamelers Club, plant tour of Whirlpool-Seeger, Clyde, Ohio, May 11.

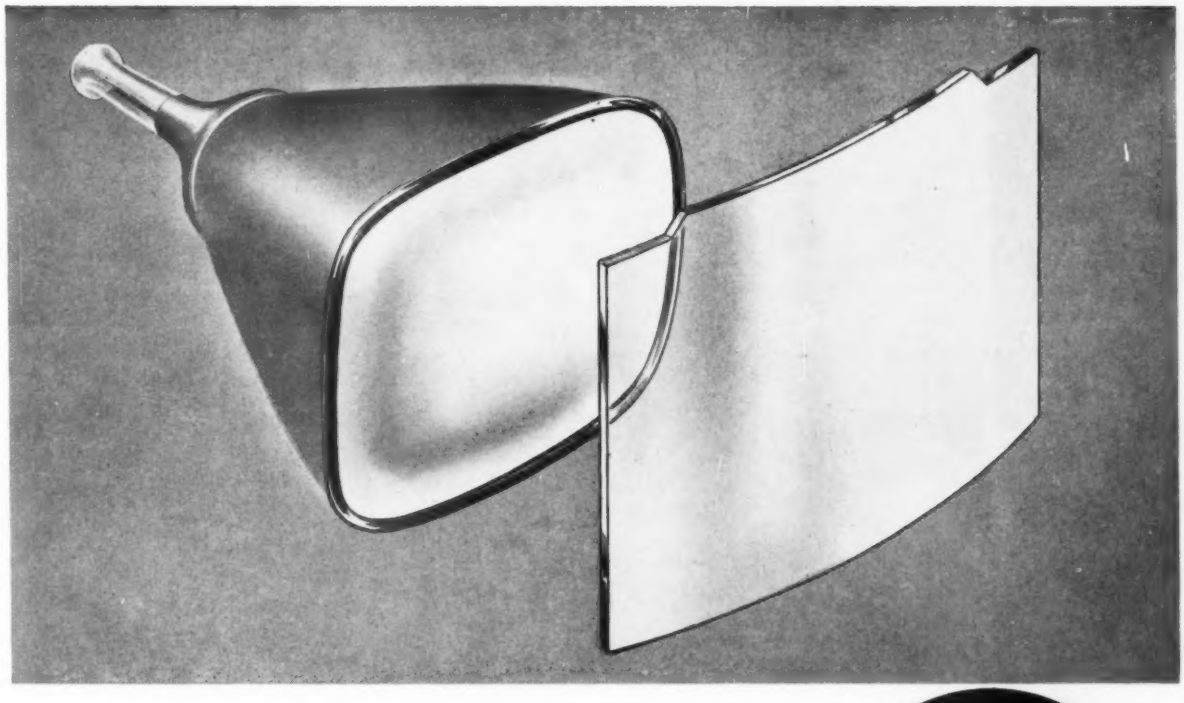
Midwest Enamelers Club, Maypole Party, White Pines Country Club, Bensonville, Ill., May 25.

PLASTICS EXPOSITION

The Society of the Plastics Industry, Inc., 7th National Plastics Exposition, Coliseum, New York City, June 11-15.

STEEL KITCHEN CABINET MFRS. ANNUAL MEETING

Steel Kitchen Cabinet Manufacturers Association, Annual Meeting, Greenbrier, White Sulphur Springs, W. Va., June 1-3.



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Glass — enhances the beauty and broadens the acceptance of your product whether in the utility appliance field or the growing electronic industry.

Glass — adapted with skill and precision by MARSCO to meet your product requirements — For Today — For Tomorrow.

Glass — flat as can be — precisely shaped to fit.

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Join the major appliance manufacturers now enjoying extra sales from the appeal and prestige contributed thru the luster of glass — MARSCO'S Crystal Clear Glass.

Our engineers are experienced in incorporating glass as viewing windows in domestic appliances and television cabinets.
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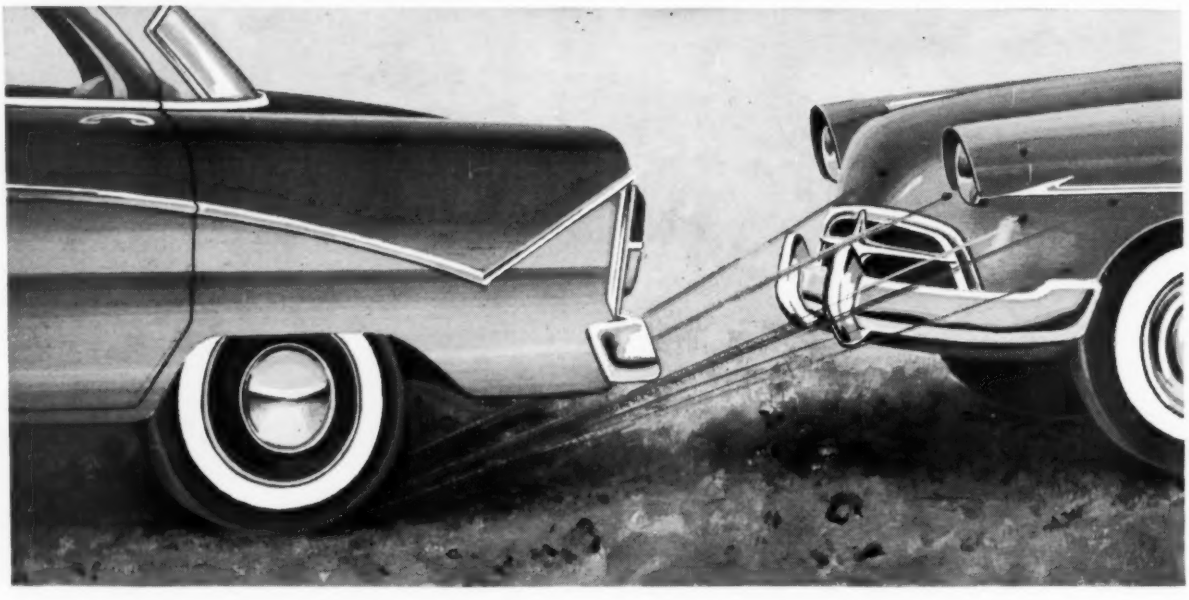
NOW—Startling impact and corrosion resistance under organic finishes...



with this NEW zinc-manganese phosphate coating—

PENNSALT FOSBOND 64!

Give rough-used painted metal surfaces the utmost protection from impact and corrosion—give them new FOSBOND® 64 zinc-manganese phosphate protection! Glossy organic finishes on steel surfaces such as auto bodies, appliances, and furniture stand up far longer under sharp, paint-chipping impacts when they've been locked on with Fosbond 64. Steel surfaces treated with Fosbond 64 resist corrosion from severe weathering far longer than steel treated with other phosphate coatings.

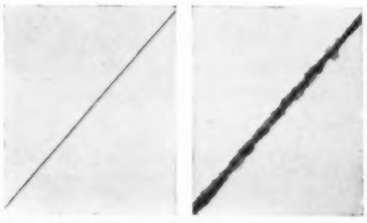
The outstanding protection offered by Fosbond 64 is the result of completely new thinking in phosphate coating. Fosbond 64 offers you a *new high* in reliability.

GET THE WHOLE STORY. If your product must withstand severe impact *and* severe corrosion, learn how Fosbond 64 protects against *both!* Call your Pennsalt man, or write Metal Processing Department 300, Pennsylvania Salt Manufacturing Company. East: Three Penn Center Plaza, Philadelphia 2, Pa.; West: Woolsey Bldg., 2168 Shattuck Ave., Berkeley 4, Calif. In Canada: Pennsalt Chemicals of Canada, Hamilton, Ontario.

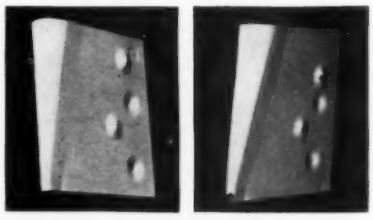
Pennsalt Chemicals

Metal Cleaners • Phosphate Coatings • Cold-Working Lubricants

CHIP-RESISTANCE. Test panels pre-coated with Fosbond 64 take twice as many inch-pounds of impact (on standard DuPont Chip Tester) as finish applied over conventional zinc-phosphate coating.



SALT-SPRAY TEST. After 300-hour exposure, Fosbond 64 (left) allows no creep of corrosion under paint, while conventional zinc-phosphate coating (right) shows ⅛" undermining of paint film.

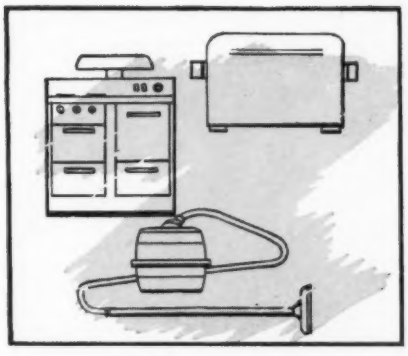


IMPACT TEST. Paint applied over Fosbond 64 (left) doesn't fracture on direct and reverse impact and bending over conical mandrel, while paint over normal zinc-phosphate coating (right) fractures from same treatment.

A BETTER START FOR YOUR FINISH

Du Pont . . . . . .

PORCELAIN ENAMELS FOR ALUMINUM



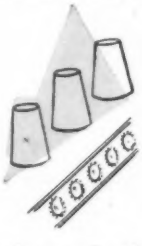
create profitable new volume for enamelers . . .

With the increased use of aluminum in modern products, enamelers are finding Du Pont porcelain enamels for aluminum the key to increased profits. This is true of enamelers who fit aluminum into their regular production schedules as well as those who have converted completely to aluminum finishing.

Depending on your facilities, every shape and application of aluminum offers itself as a potential use for these colorful finishes. Here are a few of the important applications:

- Roofing
- Structural Siding
- Wall and Ceiling Tiles
- Furniture and Cabinets
- Signs and Labels
- Appliance Parts
- Pipes and Fittings
- Electrical Shielding

Du Pont porcelain enamels are easily applied with conventional equipment. Because of this, aluminum enameling can offer new profitable volume to the enameler who wishes to add aluminum to the materials he now finishes, or to convert his entire operation to aluminum finishing.



Aluminum is easy to work. This enables you to prepare more furnace-ready units in less time. And handling and shipping costs are at a minimum with aluminum.

The range of colors and surface finishes of Du Pont porcelain enamels for aluminum is without limit. An excellent finish-to-metal bond gives you a virtually indestructible surface.

The coupon below will bring complete information. Why not see for yourself how they can increase your enameling volume? Du Pont manufactures porcelain enamels for aluminum . . . does no enameling. As a pioneer developer in these finishes, we offer our customers a wide range of technical know-how. Or we can put you in touch with experienced enamelers who can service your needs.

. . . new sales for the fabricator

Fabricators too, are cashing in on the color—and sales appeal Du Pont porcelain enamels add to aluminum.

Du Pont porcelain enamels give unlimited colors and surfaces, ranging from matte to high gloss.

Aluminum finished with Du Pont enamels can be sawed, sheared, punched and drilled without spalling. Welding on the reverse side does not damage or discolor the coating.

And a coating of Du Pont porcelain enamel increases the rigidity of sheet aluminum up to 60%, making it possible to use lighter-gauge aluminum. This can substantially reduce the weight of your product.

Lifetime coatings of Du Pont porcelain enamels for aluminum are lightfast—have excellent resistance to corrosion, impact and thermal shock—do not stain or discolor. They are impervious to salt-water attack. A high dielectric strength—500 volts per mil thickness—makes these enamels ideal for shielding and insulating uses.

Need more information? Mail the coupon below.

DU PONT PORCELAIN ENAMELS FOR ALUMINUM

DU PONT

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

E. I. du Pont de Nemours & Co. (Inc.)
Electrochemicals Department F-5, Wilmington 98, Delaware

☐ Please send booklet on Porcelain Enamels for Aluminum.
☐ Please have a representative call for an appointment.

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look . . .

it's

TITANOX®

Yes, it's the white pigment that helps make a finish that dreams are made on. TITANOX-RA-50 and TITANOX-RA-NC are the chalking-resistant rutile titanium dioxides that make white and pastel dream finishes practical.

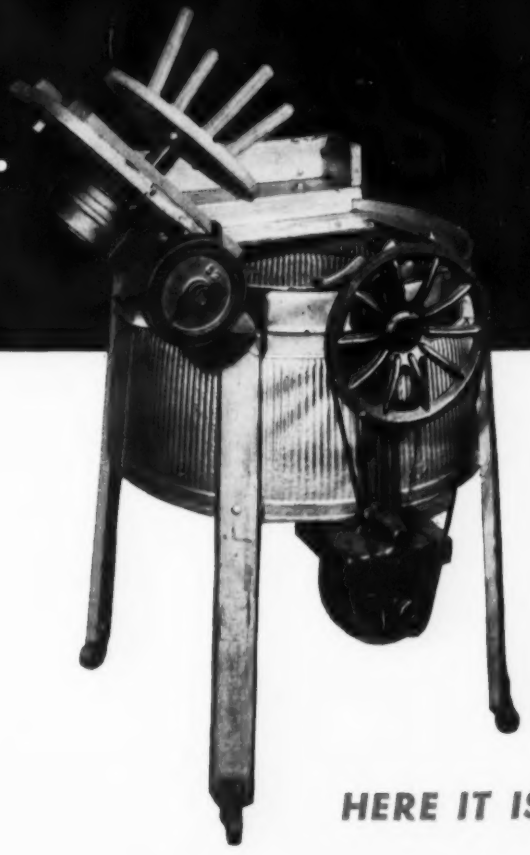
Titanium Pigment Corporation (subsidiary of National Lead Company), 111 Broadway, New York 6, N. Y.; Atlanta 5; Boston 6; Chicago 3; Cleveland 15; Houston 2; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 14, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.

3871-A

General Electric announces...

THE MOST IMPORTANT DEVELOPMENT IN APPLIANCE MOTORS

since washers looked like this...



NEW POWER FOR WASHERS, DRYERS, DISHWASHERS, IRONERS, AND FOOD WASTE DISPOSERS

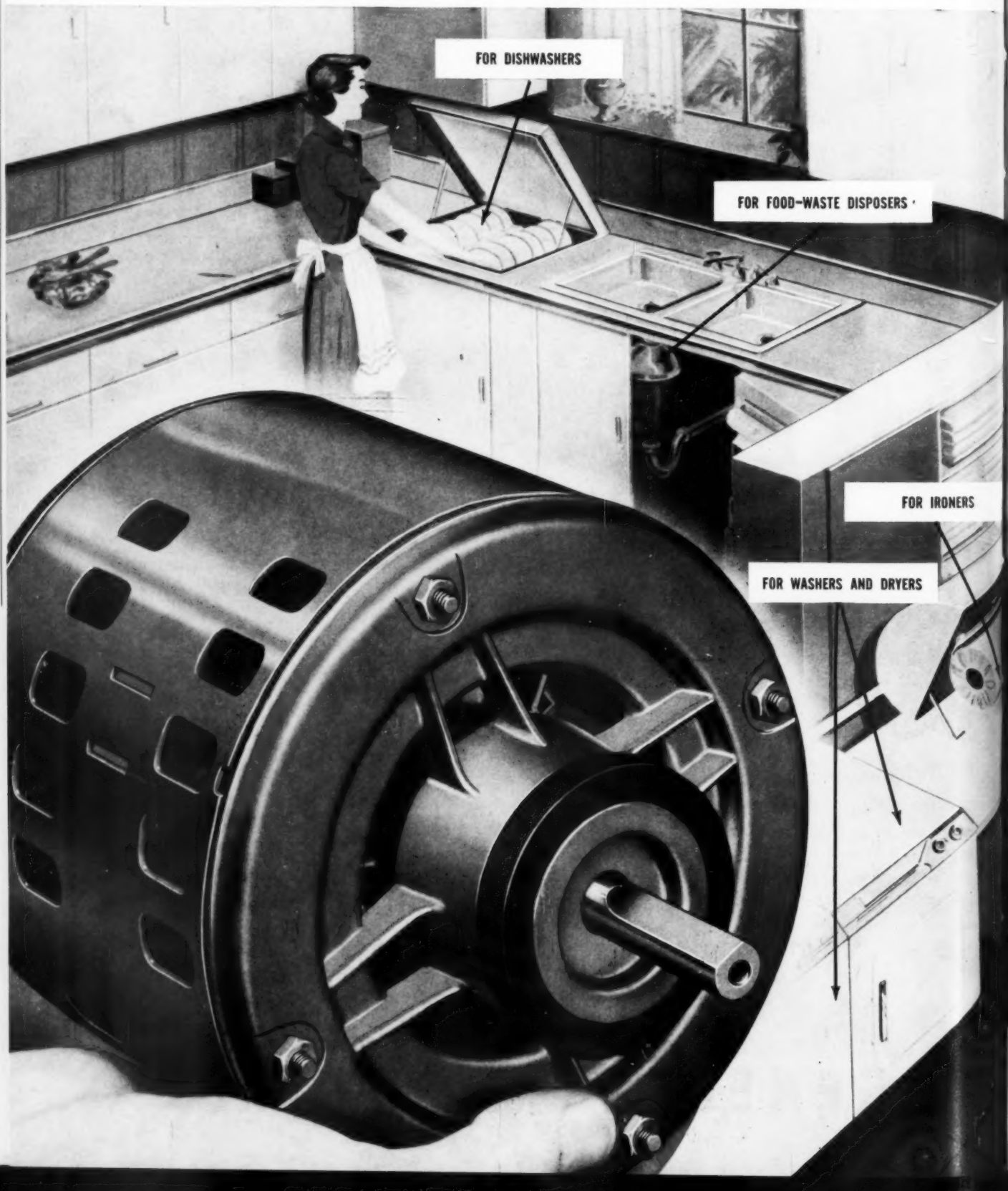
This washing machine—one of the first steps away from the hand-crank—doesn't bear much resemblance to its present-day offspring. But the motors which power today's washers are essentially the same as they were 25 years ago. True, refinements have been made from time to time. But now, for the first time, *all* the new materials and engineering improvements of the past 25 years have been combined into one integrated design—the entirely new G-E appliance motor!

HERE IT IS

GENERAL ELECTRIC

NEW G-E APPLIANCE MOTOR . . .

Designed Specifically fo



for Modern Appliances

. . . and built by appliance motor specialists who give 100% attention to problems and requirements of appliance manufacturers

An entire General Electric department, in De Kalb, Illinois, is devoted exclusively to appliance-motor design and manufacture. Right now, finishing touches are being put on new plant facilities for high-volume production of a new motor for washers, dryers, dishwashers, and food waste disposers.

This new General Electric appliance motor was designed to a rigid set of specifications: to help you cut down appliance assembly costs, improve appliance performance, and heighten your customers' satisfaction.

A few of the new and exclusive features of the new G-E motor: Mylar* insulation (35 times greater moisture resistance, 8 times tougher); 24% lighter weight for easier handling; 5 times better ventilation to assure longer life; and a 64% larger terminal board to make hookup easier.

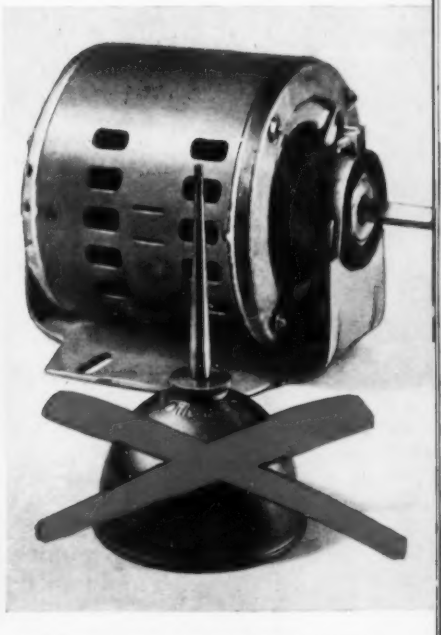
At General Electric, you will find real understanding of your problems—and the best motor yet designed for your products. For more information, contact your G-E Apparatus Sales representative, or write for Bulletin GEA-6381. *General Electric Co., Schenectady 5, N. Y.* 705-2

Progress Is Our Most Important Product

GENERAL ELECTRIC

24% LIGHTER, ½" shorter per rating—saves space, makes handling easier. However, it is completely interchangeable, both electrically and mechanically.

VASTLY IMPROVED INSULATION of Mylar* polyester film (right) has 35 times greater resistance to moisture and humidity than conventional insulation (left).



BEARINGS NEED NO OILING because of completely sealed design and large oil reservoirs. You install the new G-E motor—your customers can forget it!

*Dupont trademark for polyester film.

RHEEM our Largest Customer

VISEGRIP

for Steel Drums

Every Rheem container plant in the U. S. is equipped to insert **VISEGRIP** closures in steel drums and provide **FLEX-SPOUT** for steel pails.

Insist on the ALL STEEL drum closure **VISEGRIP** and the only hermetically sealed pour-spout for pails— **FLEXSPOUT**

FLEXSPOUT for Steel Pails

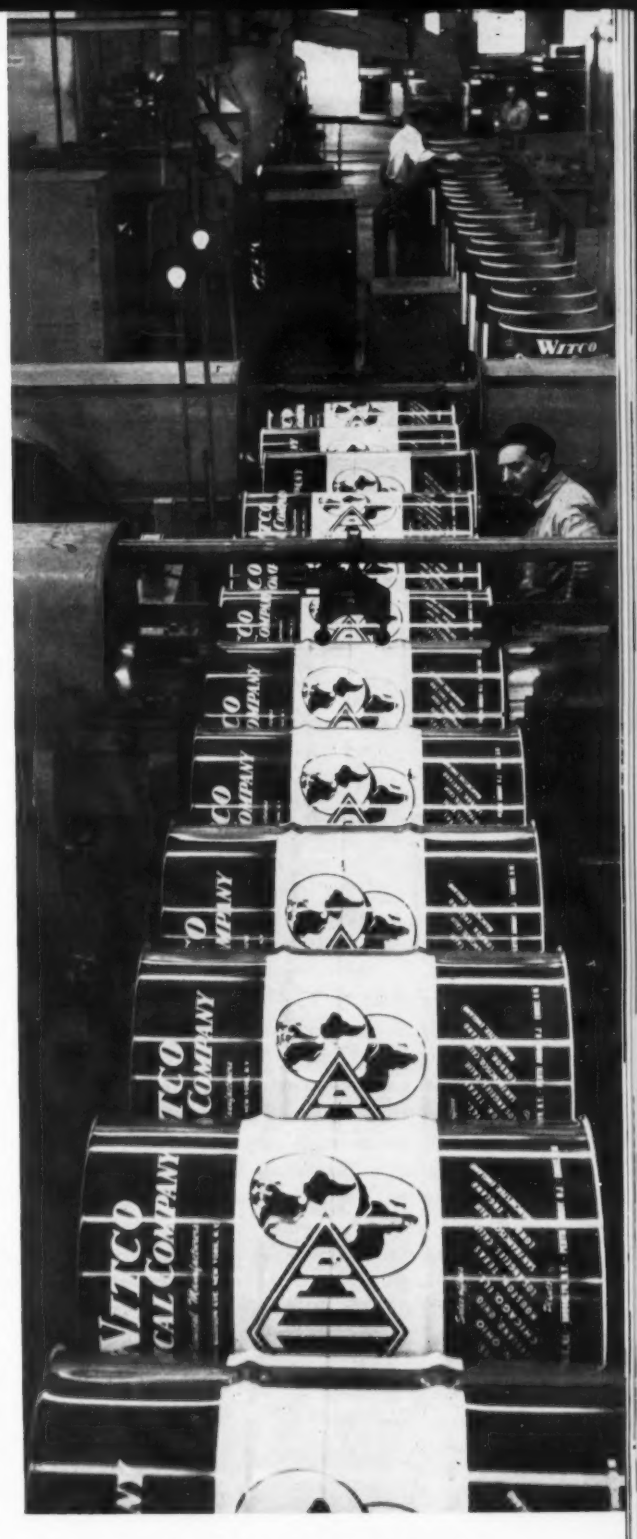
Our technicians are available to you on any difficult problem and to equip you with tools whenever our products are specified.

RIEKE METAL PRODUCTS CORPORATION

AUBURN, INDIANA — PHILADELPHIA, PENN. — HOUSTON, TEXAS
NEW YORK, N. Y. — CHICAGO, ILLINOIS — OAKLAND, CALIF.

Ultra-modern production lines for steel drums

how Rheem manufactures 600 lithographed 55-gallon drums hourly in a semi-automatic production system



Exclusive feature finish

We read a lot about "automation" these days, but plant engineers at Rheem Manufacturing Co. were utilizing principles of "automation" long before it became an over-worked word in the non-technical public press. Evidence of this is contained in the steel drum production lines that have been in operation for several years at various of the Rheem plants. These lines are tooled and automated in a manner to turn out approximately 600 roller coated, lithographed and fabricated steel drums an hour.

The prevailing principle of automation along these lines is the way they are tooled so that the output of one machine is automatically fed into the next. Secondly, many of the machines are entirely automatic in operation.

Electrical controls pace flow

And third, a series of interconnected relays and limit switches control material and product flow in a manner to prevent overloading or "clogging of work" anywhere along the line. Automatic material and product handling and positioning, automatic counting, automatic conveyor loading and automatic test equipment decrease manual operations, decrease the chance for human error and facilitate speed throughout the production cycle.

As representative of all Rheem steel drum production lines, one of the two lines currently in operation at the company's Chicago plant is described here. This line, like all the others, is tooled to turn out about 600 completed steel drums an hour.

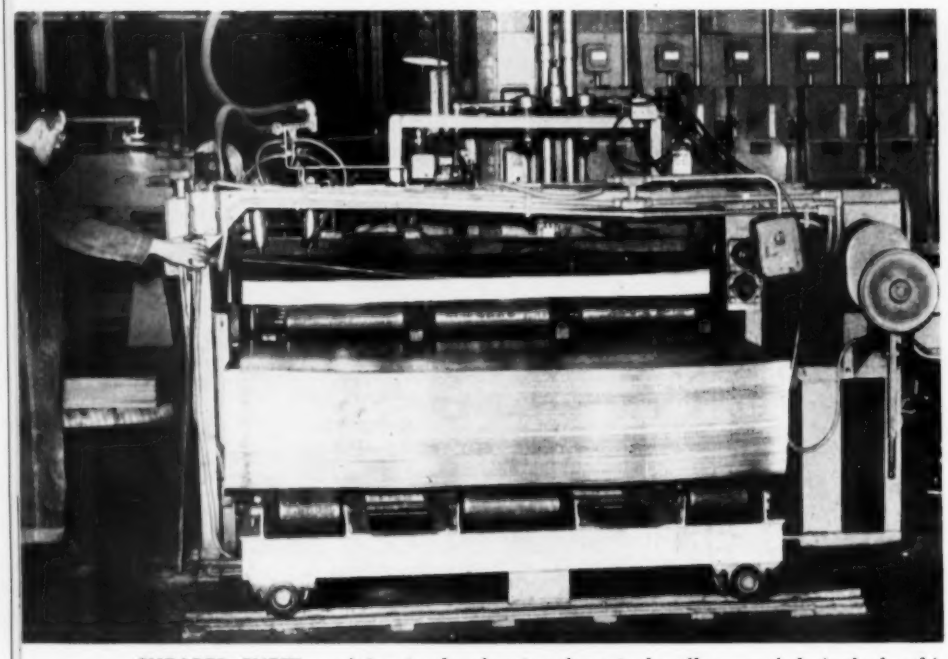
The drums turned out by this line are all of 55 gallon capacity, are a fixed 22½ inches in diameter, and nearly all of them are made from 18 gauge hot rolled steel. Other Rheem drum lines are equipped with variable tooling so that drums of different sizes and of other metals can be produced.

Material for the drum line is purchased in flat sheet form with each sheet containing enough material for two drum bodies. A single shearing operation followed by a trim operation on the second sheet is all that is required to prepare the raw material for production.

The sheared sheets are delivered in bundles to the metal cleaning dept. Here an automatic loader picks up each sheet and places it on a belt leading into the blast cleaning equipment. Shot is used for blasting. After blasting, the sheets continue on through leveling rolls, then through a detergent wash and a hot water spray rinse. Immediately beyond the spray rinse the sheets are dried by squeegee rolls, then pass through another set of rolls where a cold phosphatizing solution is applied by roller coaters. Beyond the phosphatizing rolls the sheets are dried and then automatically palletized for delivery to the metal finishing department. Only two employees are required to man this metal cleaning and treating set up — one at the feed end, the other to control the final bundling. Water used in the spray rinse section is recirculated to conserve heat. The sediment that gathers in the re-circulation tank is cleaned out daily.

Roller coating and lithographing

In the metal finishing department the prepared sheets are again automatically loaded onto a conveyor which carries them through a roller coating machine. Sheets emerging from the roller coater feed automatically into the wickets of a 220 ft. drying oven. Drying or baking



SHEARED SHEET, *arriving in the cleaning dept. in bundles, are fed singly by this automatic leader onto a belt which feeds into the shot blasting machine where metal cleaning is accomplished. While this report is on the 55-gal. line all the automatic machines in line are tooled to handle other sizes.*

PHOSPHATIZING *is accomplished with this olls w chine. The previously sheared sheets are bized s and sent through a hot water rinse spray, n a sq roll-squeegeed dry and passed through anothe*

temperature depends upon the base coat being used at the time. Coating thickness can be controlled within one mil by the roller coater. When sheets require different base coats on opposite sides, a second roller coating operation is necessary.

This second roller coating operation is facilitated by revolving wickets mounted integrally on a shaft just beyond the oven wicket chain. The sheets feed from the oven wickets into these revolving wickets which turn them once over before they are delivered to a stacker which automatically rebundles them. Thus, the sheets are rebundled "right side up" (or unpainted side up) for their second trip through the roller coater.

After roller coating, the sheets are ready for the lithograph application of any desired design or printed message. Each color used in this design requires a separate lithograph operation, and sometimes a desired color is produced by lithographing two colors, one over the other, to produce a required color match.

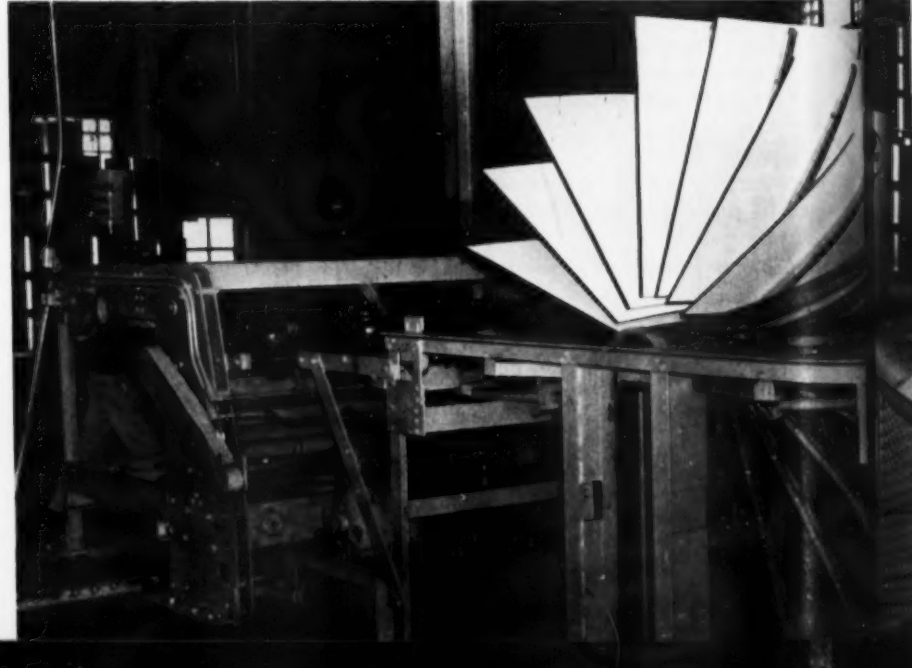
The lithograph feeds the printed sheets into the same drying oven that serves the roller coater, so the lithograph and roller coater cannot be used at the same time. The sheets leaving the lithograph pass over a fold-away conveyor section directly onto the roller coater conveyor, pass through the raised roller coater rolls and thence onward into the drying oven wickets.

Fabrication after finishing

After the final trip through the drying oven the painted and lithographed sheets are ready for the drum fabrication line. The first machine on this line is a combination roll former and seam welder. The bundled sheets from the metal finishing department are once again automatically loaded onto a conveyor which carries them into the roll former. Before entering the rolls the sheets are edge grit blasted on each end to provide a clean metal surface for the roll welder. This is accompanied by automatic blasting nozzles on each side of the conveyor, utilizing recirculated grit.

The formed drum bodies emerge from the roll former directly into the seam welder where a fusion lap weld is pro-

DRIED COATED SHEETS *are conveyed from the oven and, by means of revolving wickets such as these, automatically turned over and fed to a stacker which bundles them up, ready for reprocessing, with the unpainted side up, should a different base coat be required on the opposite side of the sheet.*



this ...olls where a cold phos-
re bi...zed solution is applied
pray, ...n a squeegee action.

LITHOGRAPHING *is then done on the flat sheet. The sheets are then fed into the former where they are shaped into drums and welded. The weld seam is automatically given a paint touchup.*

...d. An extension arm attached to ...lower roll support arm of the welder ...nts an automatic spray gun which ...ints the inner side of the weld seam ...he welded drum body leaves the ...er.

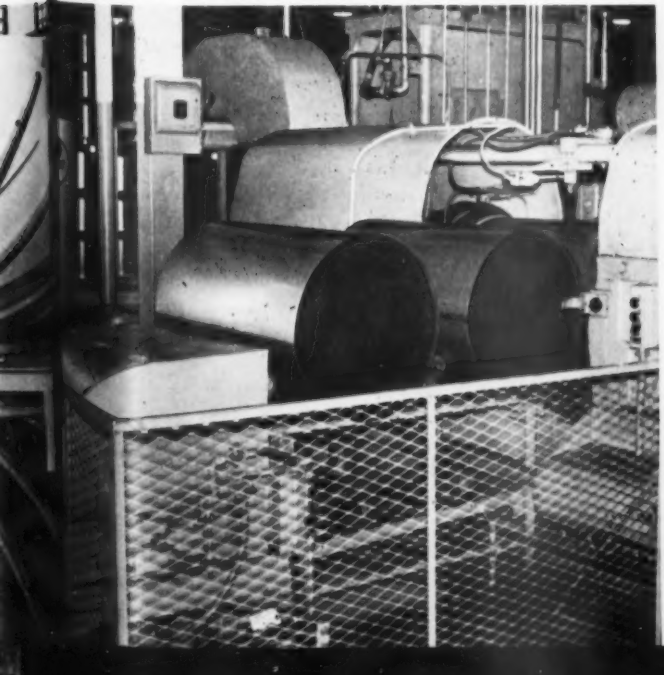
...d up to assure smooth flow

...eyond the roll former and welder ...drum bodies enter upon an extended ...th of conveyor before they reach the ... machine. This lengthy conveyor section serves two purposes — first, it gives the paint applied to the interior of the weld seam time to dry. This drying is expedited by heater strips. Secondly, it provides a "storage section" for welded drum bodies which provides a "cushioned" supply for the remainder of the fabrication line.

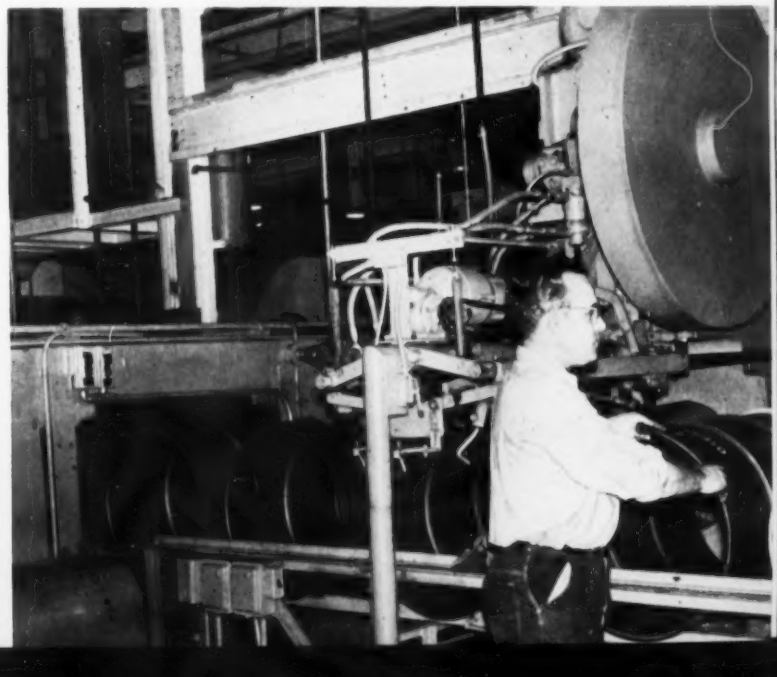
When the drum bodies reach the end of this extended conveyor section, they are automatically loaded in a horizontal position of the indexing conveyor.

QUALITY CONTROL *is a continual operation. In this phase, the drums are being air tested for leakage. Inspection of completed drum is made prior to adding closures to the fittings and heads.*

...LING HOOPS *are then formed to give sidewalls addi...l rigidity and act to distribute weight of content when ... is rolled on side. Operation is accomplished by ex...ding chucks entering the ends of drum automatically.*



FLARING *is then accomplished. Automatically, the drums, previously welded, are transferred in rolling position to the end flaring machine. Tapered mandrels are forced a short distance into each drum end, producing the slight rim flare.*



STEEL DRUMS CONTINUED

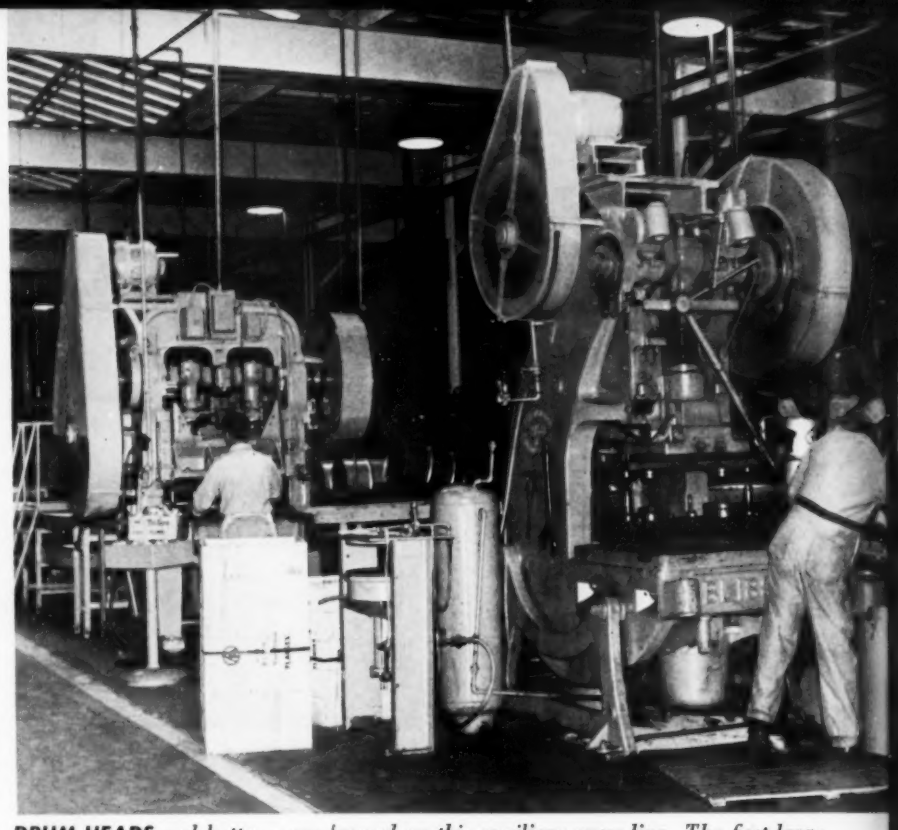
The next operation is the end flaring machine. Here, tapered mandrels are forced a short distance into each end of the drum producing a slight rim flare. The drums index automatically from this machine into a second machine of similar design where expanding chucks enter each end of the drum, expand, then roll form the hoop-like swages. These swages provide additional sidewall rigidity.

Auxiliary fabrication units

Three Horn presses that can be used or bypassed as required are next in line. The first press is for piercing and extruding drum body openings when and if required. The second press is used to install the necessary flanges in these openings. The third press both pierces and extrudes the opening and installs a special type of flange all in one press stroke. Arms automatically pick up the drum bodies, feed them onto the Horn presses and return them to the line.

Main fabrication operation

Just beyond the Horn presses, the drum top and bottom sections enter the main fabrication line from an auxiliary heavy press line. On this line the first large 200-ton press blanks and draws the tops and bottoms from sheet stock. This sheet stock is already painted and lithographed as required. The next press pierces and extrudes any openings necessary, while a third inserts and crimps the drum head flanges. A final press operation is used when any embossing is required. The tops and bottoms then enter the main fabrication line and are hand-positioned on the drum body.



***DRUM HEADS** and bottoms are formed on this auxiliary press line. The first large 200 ton press blanks and draws the tops and bottoms from sheet stock, previously lithographed. The second press pierces and extrudes necessary openings; the third inserts and crimps the drum head flanges. Embossing is also done.*

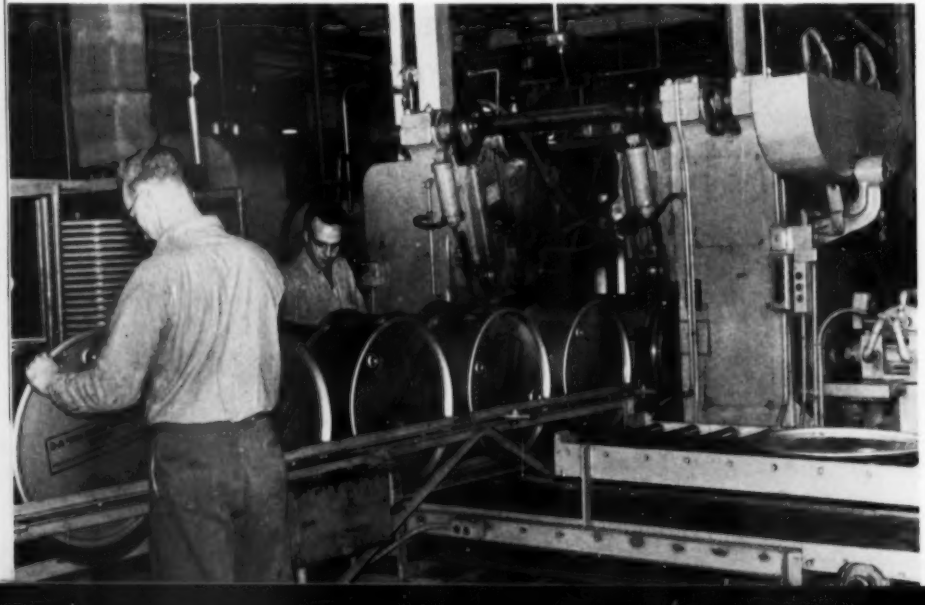
The next machine into which the drums feed automatically is an ingenious metal spinning machine that crimps the rims on each barrel head and bottom to the flared rims on the drum body. This is termed a "double seaming" operation and results in a dependable, leak-proof joint between the drum body and the two end closures.

Drums are then air tested

Beyond this spinning machine the drums are up-ended to a vertical position on a roller conveyor and pass into the air test machine. Here the drum is automatically subjected to 7 psi air pressure, while the inspector soap tests both the sidewall weld seam and the double seam that joins the heads and bottoms to the drums.

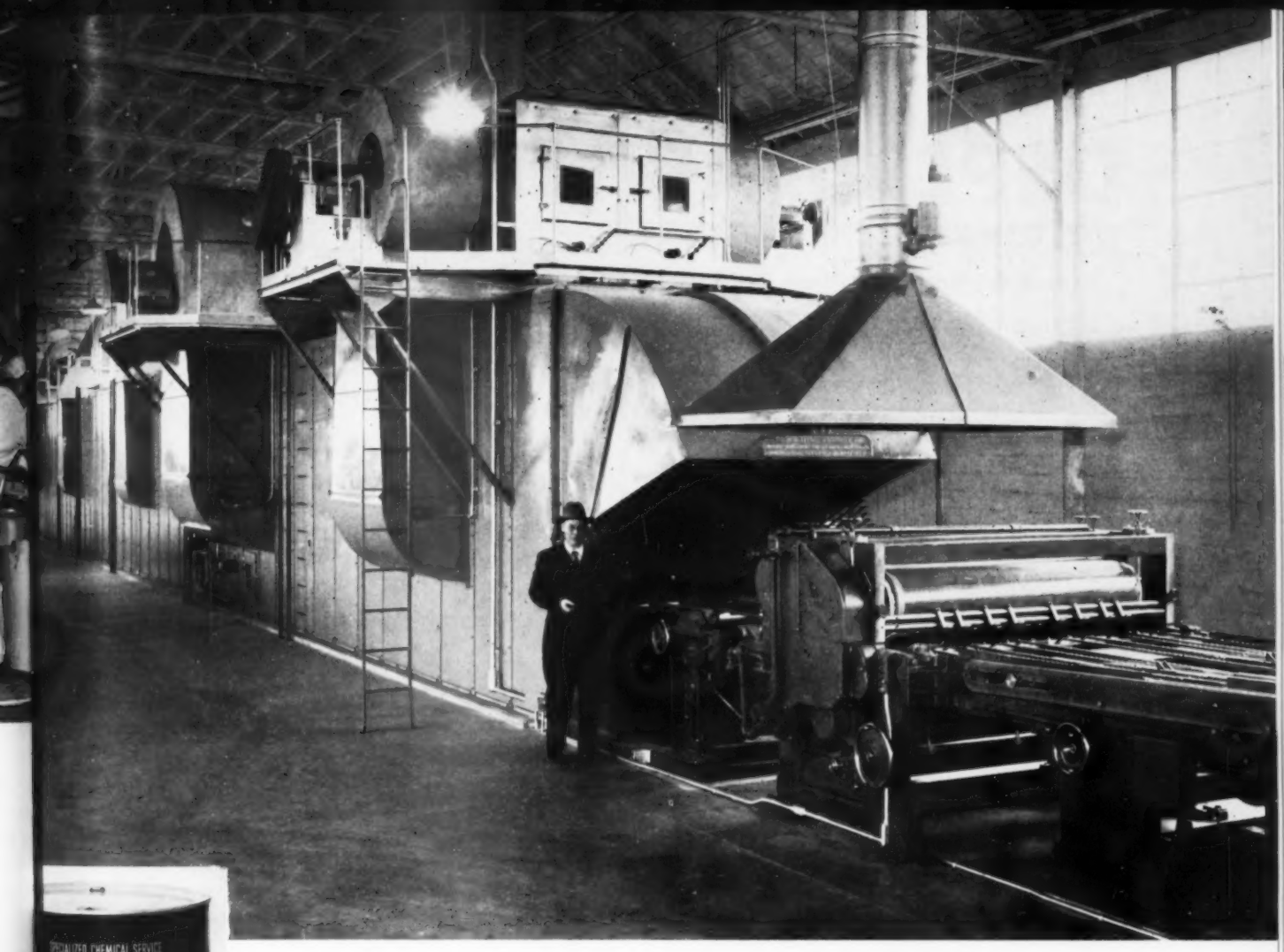
The last line operation is touch up of the exterior drum body weld seam in a booth. Leaving this booth the completed steel drum travels into the shipping area.

***DOUBLE SEAMING** is accomplished next, with drum heads, equipped with specified fitting, placed into position before drums approach the double seamer shown at center toward right in the photo. Note the feed-in of drum heads to main conveyor line.*



Operational summary

Rheem engineers are the first to admit that their drum lines are not automated to a point where electronic controls or magnetic tapes supercede the human element. But the automated features of the lines do absorb a great amount of detailed, repetitive work and do operate and keep production flowing at an even keel. This is the type of modified automation that is making its appearance on many production lines, combining the latest in production equipment with the talents of experienced production workers, to create skilled observers of personnel, eliminating the "brunt and brawn" normally found in this type of industry.



Coating and Baking sheets for 55 gallon steel drums in Richmond, California

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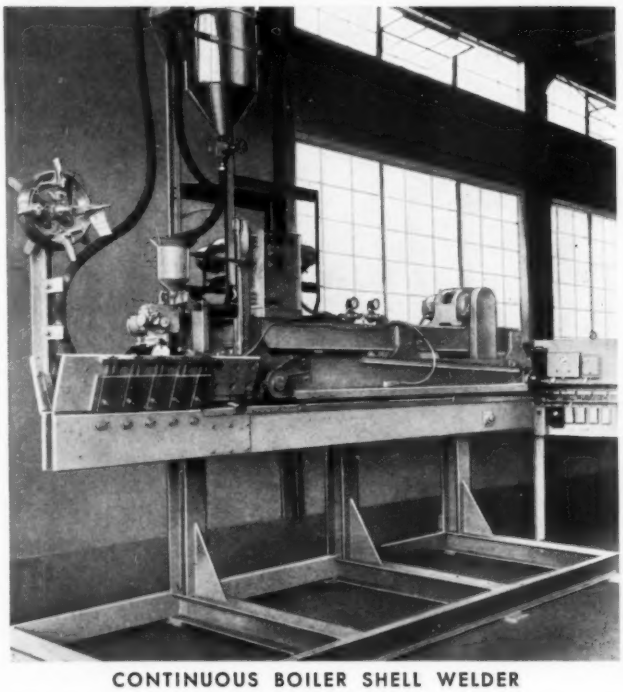
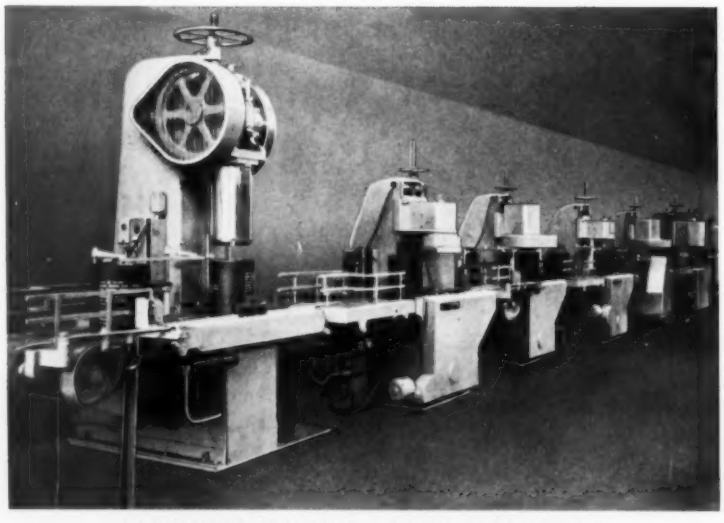


CONTINUOUS BOILER SHELL WELDER



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How versatile is your punch press operation?

"A punch press with the proper dies can out-produce a tool costing several times as much", says West Coast operator who details out versatility of the shop press.

by Gilbert C. Close • FINISH WESTERN EDITOR

"THE punch press is inherently a high-production, low-cost tool, and when provided with a proper array of single action and progressive dies, becomes one of the most versatile production instruments in the entire machine tool category."

These are the words of Barry L. Miller, owner-manager of the Barry L. Miller Engineering Co., Hawthorne, Calif. This firm designs and makes some of the most intricate and efficient punch press die mechanisms used in the entire Southern California area. Some of the dies are for their own production use, but mostly they are for outside firms. Prior to opening his own company, Miller spent twenty years in die design and die making and as an experimental machinist.

Some by-pass opportunity

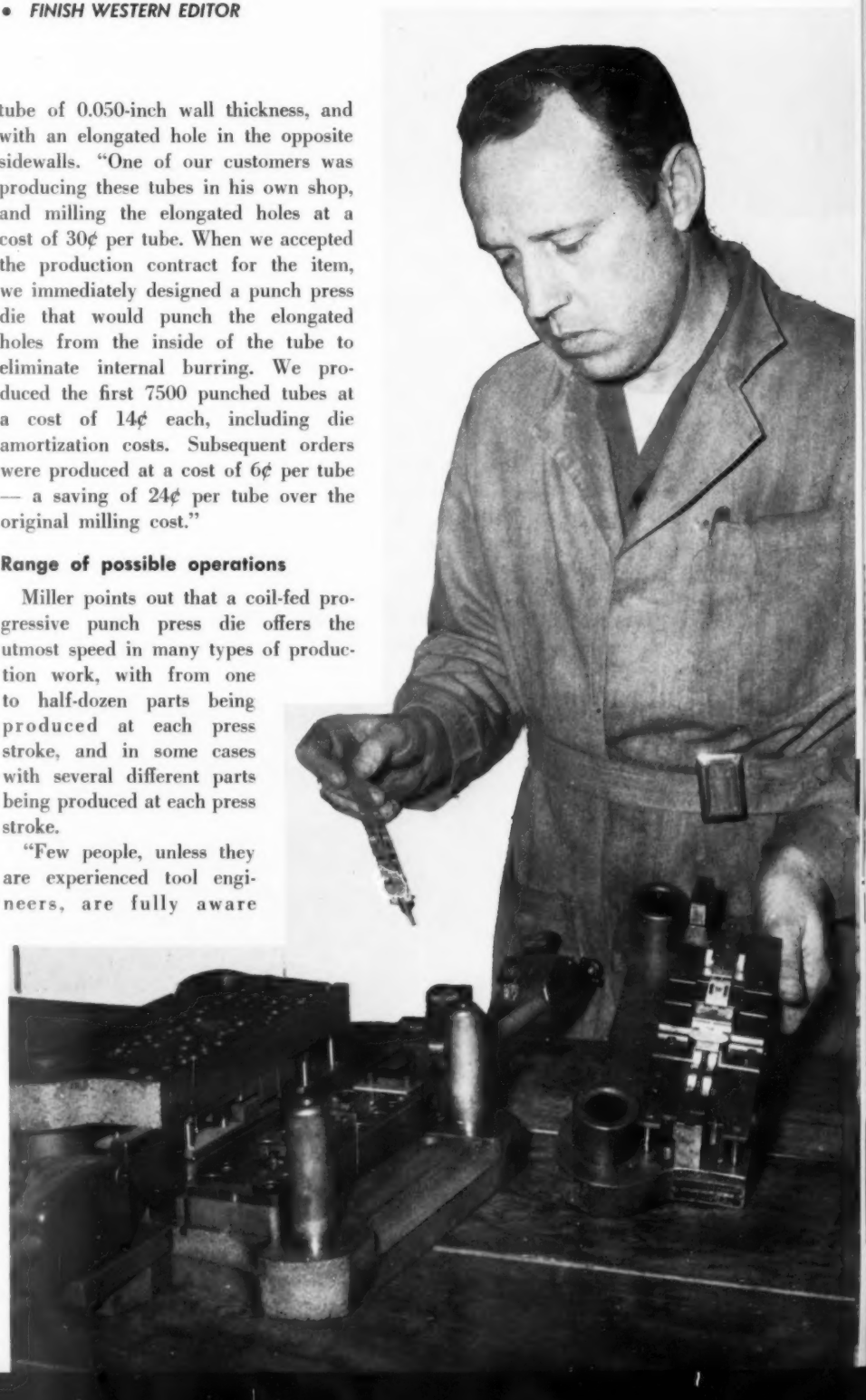
The average small machine shop owner or operator, interested in increasing production, spends too much time in pouring over machine tool catalogues and too little time in investigating the latent possibilities of his own equipment", Miller advises. "The punch press department is a good place to start such an investigation. A punch press with the proper dies may outproduce a tool costing several times as much. And often the cost of production on the punch press will be substantially less than for any other production technique available."

To emphasize his words, Miller produced a small No. 302 stainless steel tube of 0.050-inch wall thickness, and with an elongated hole in the opposite sidewalls. "One of our customers was producing these tubes in his own shop, and milling the elongated holes at a cost of 30¢ per tube. When we accepted the production contract for the item, we immediately designed a punch press die that would punch the elongated holes from the inside of the tube to eliminate internal burring. We produced the first 7500 punched tubes at a cost of 14¢ each, including die amortization costs. Subsequent orders were produced at a cost of 6¢ per tube — a saving of 24¢ per tube over the original milling cost."

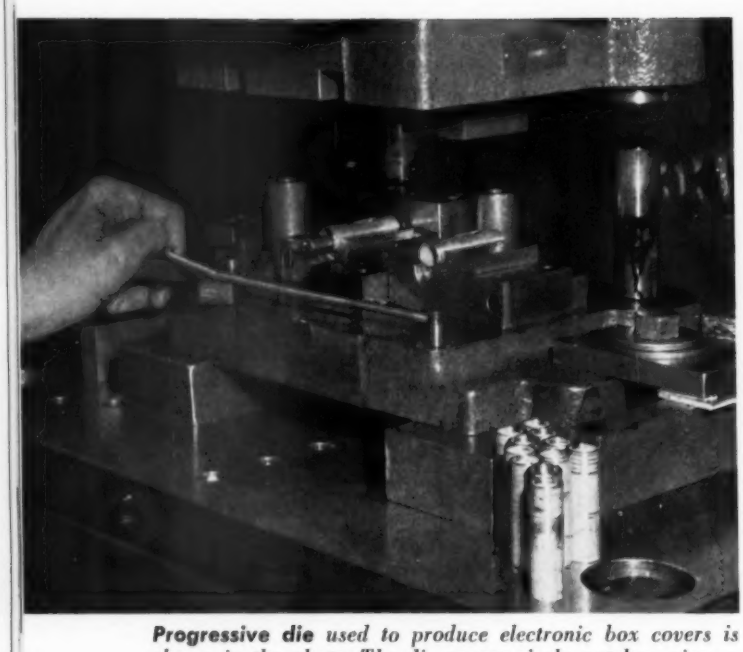
Range of possible operations

Miller points out that a coil-fed progressive punch press die offers the utmost speed in many types of production work, with from one to half-dozen parts being produced at each press stroke, and in some cases with several different parts being produced at each press stroke.

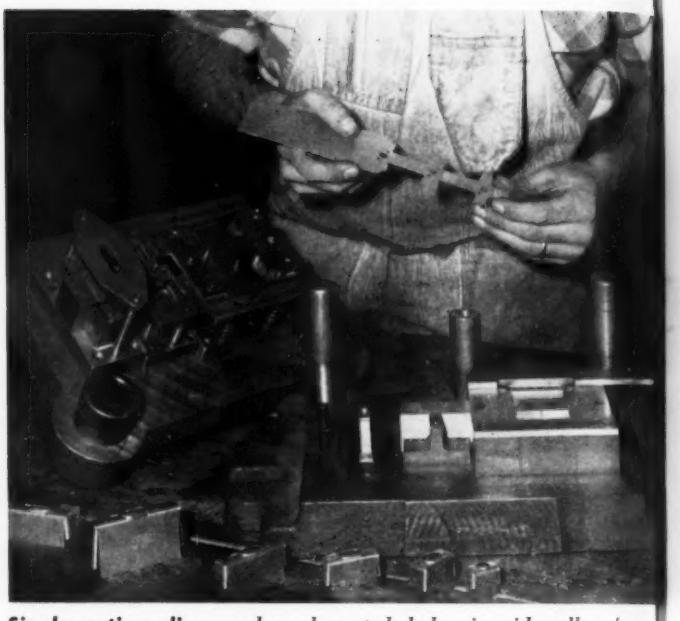
"Few people, unless they are experienced tool engineers, are fully aware



Designer *Barry Miller shows the progressive die he created to produce four specialty-type pronged stainless steel clips in single press stroke. Coil fed die is made safe by microswitch use.*



Progressive die *used to produce electronic box covers is shown in the photo. The die progressively notches, pierces, extrudes holes. It then folds the box cover into shape completing this multi-operation.*

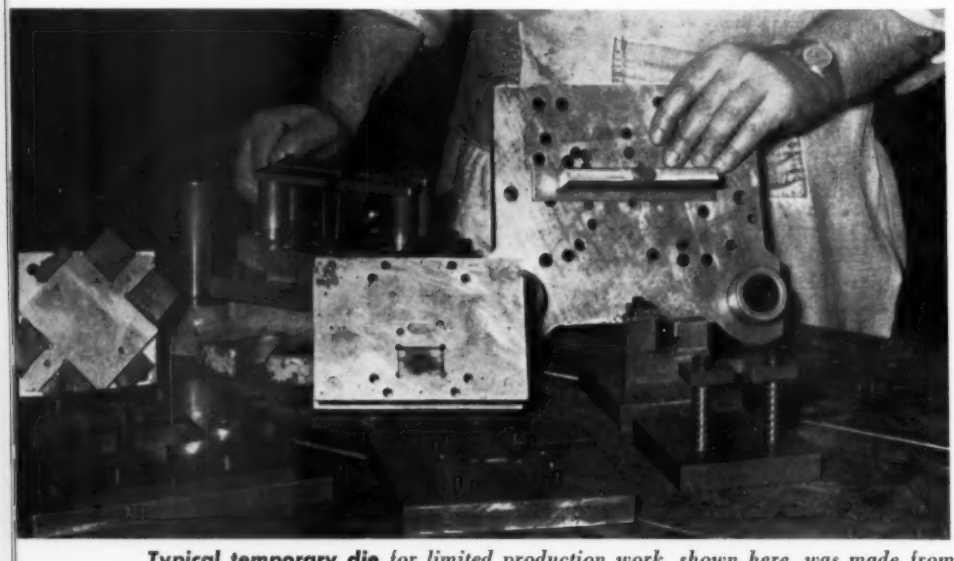


Single action die *punches elongated holes in sidewalls of tubes shown in foreground. Punching action is from interior to eliminate internal burrs. Cost of milling holes was about 35¢ per tube; cost of punch, 6¢ per tube.*

PUNCH PRESS CONTINUED

of the inherent possibilities of a well-designed progressive punch press die", Miller says. "Such dies have been built with up to 20 stages of operation. The various operations performed as the material travels through the die may include trimming, piercing, notching, extruding, forming, blanking, swaging, counter sinking, shaving, embossing, and stenciling and the application of trade marks.

As long as the die does not become overly cumbersome in size, the various stages of operation may be included in multiples, thus producing more than one part per press stroke. In other progressive dies, parallel but different stages of operation may be included, thus making it possible to produce several different parts in each press stroke. In this latter type of die, and with proper forethought, maximum blanking efficiency from a given width of coil stock can be obtained".



Typical temporary die *for limited production work, shown here, was made from parts of obsolete dies. Excess drilled holes show how die material was used before. Sometimes, simple alterations on obsolete components will result in new die.*

Two operations replace six

Quite recently a contract was accepted to produce a part that had required six separate machine operations in the customer's shop. A progressive punch press die was designed and built that would accomplish five of these operations. Now the total separate operations required to finish the part are two, not six.

In another case, a customer wanted to produce small aluminum electronic box covers. The shape of the cover indicated a costly deep drawing operation. The box cover was a non-stressed part, and it was apparent that deep drawing it from a single blanked sheet would be a uselessly expensive operation.

Simple solution to problem

One progressive and one single-action punch press die solved the problem. The first die progressively notches, pierces, extrudes the holes and folds and forms the sides of the cover. A simple closing die is used for the second operation, which merely folds the ends of the cover into place. Deep drawing, always a costly operation, was entirely avoided.

The punch press is ideally suited for

temporary tooling for short-run production work. In producing a temporary die for a limited amount of production work, a definite pattern should be followed for the most economical results.

Showing the need *for versatility at Miller's plant is the array of parts and products shown in the above picture, all of which were produced on punch presses.*

Three considerations in die production for short-run work

First, the material used in the die should be selected in accordance with the wear it will receive during its production life. Choosing die material that will outlast its useful life only adds to die cost.

Secondly, during design of the temporary die, simplicity of die fabrication should be kept firmly in mind. Increasing the number of operations necessary to produce the die adds substantially to its cost.

Catalogue your obsolete dies!

Third, nearly every shop has a number of obsolete punch press dies in its tool department. A complete catalogue of obsolete dies should be maintained at all times so that parts from these obsolete dies can be worked into the new temporary dies wherever possible. When a great amount of temporary tooling is contemplated, an effort should be made to standardize various die sections so that they can be used from one die to the next with a minimum of low-cost alteration.

Following the three point pattern of temporary die development will materially reduce the high "per part amortization costs", characteristic of most temporary tooling.

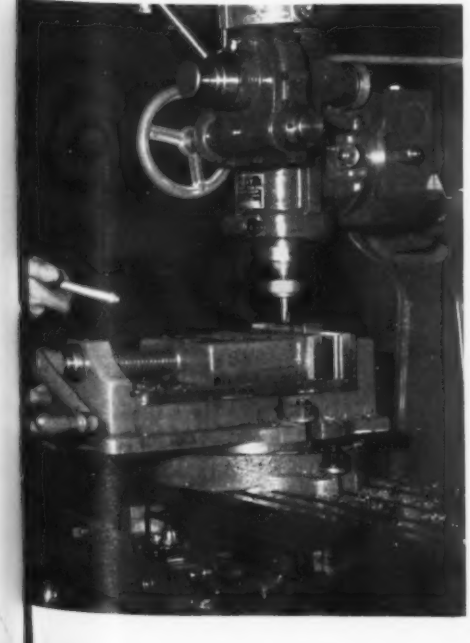
Given a good die design to work from, the average machine shop is usually equipped to produce its own punch press dies, progressive or otherwise, Miller says. Versatility of tooling is a major factor in die production, and the multi-purpose machines used in many shops provide this versatility.

The contention that the punch press is a sadly neglected tool can be illustrated by the production work. Time and again, parts have been (and are being) produced on a punch press that, prior to acceptance of a production contract, were produced by much more costly methods.

Example of economies possible

Small, pronged stainless steel clips are a good example in this connection. Once a relatively costly item, these clips are now being mass produced on a progressive punch press die from coil

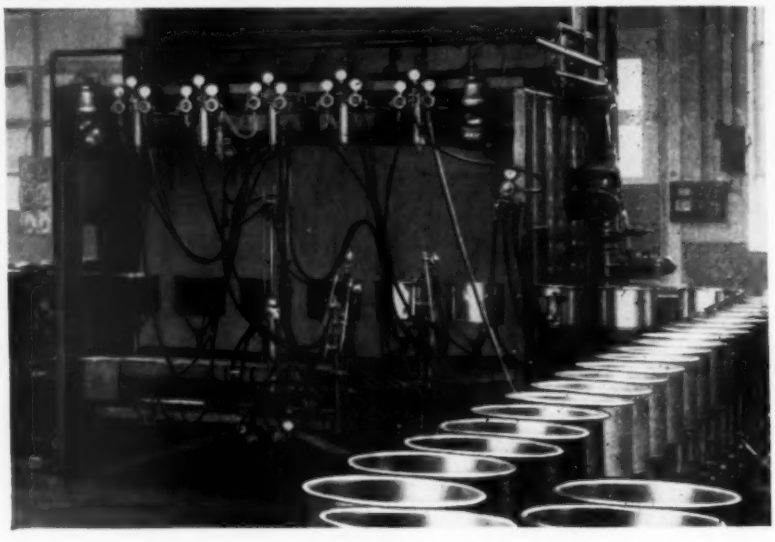
Simple but versatile *tooling is required for die making. Here, a progressive die component is machined conventionally.*



Progressive punch press die, *fast acting was used to make the biological seal cap held in the operator's hand in the photo. All die components are shown.*

finish fotos

WHAT'S WHAT in automatic spray painting



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PUNCH PRESS CONTINUED

stock at the rate of four clips per press stroke. The die feeds automatically from both directions at once and is fully controlled by microswitches which provide automatic tool protection.

Use skilled operator on press

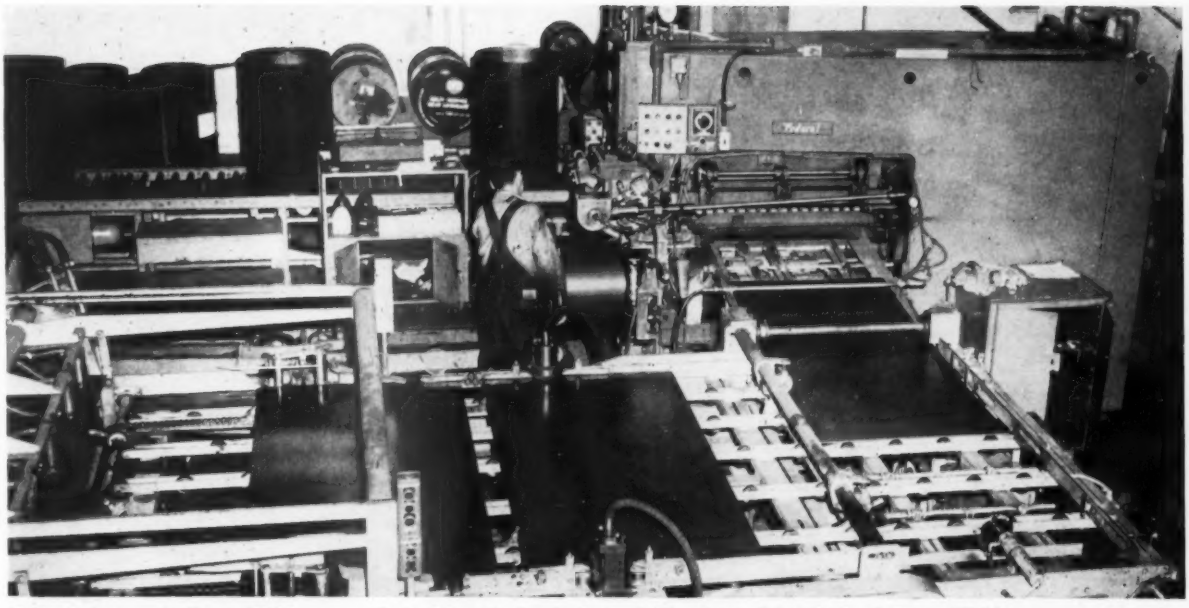
Miller issues a final warning for anyone contemplating the use of intricate punch press dies. "The saving in personnel requirements should be in number only. Naturally, when a production job requiring ten skilled operations is reduced to a single operation in a progressive die, nine skilled operators will be released for other work. But keep a skilled operator on the punch press. Even though it seems like a simple 'push button' operation, the intricate and costly progressive die in use should have expert attention".

There are no "set" formulas for designing a progressive punch press die. Each die is a problem in itself which must be worked out according to the size and shape of the part to be produced, and the number of operations to be performed upon it. The methods of transmitting "press stroke power" into "die power" are numerous and varied, but usually consist of a relatively simple train of mechanical functions. Spring compression by press stroke power is commonly used for die stripping.

Additional production suggestions

The stages within the die must be in a logical sequence so that the work performed by one stage of operation does not interfere with or complicate the work performed by the next stage of operation. When production calls for the use of more than one progressive die, the first die should leave the work in optimum condition for acceptance by the second.

"The design of a good progressive die is a challenge to engineering ingenuity", Miller says, "but the results obtained with a successful design are well worth the effort".



Federal Automatic Drum Welder at work in Rheem's South Gate, Calif. plant. Other Federal Drum Welders are working for Rheem at their Linden, Houston, Sparrows Point, New Orleans plants. Many other types of Federal Welders are working on dozens of other operations within the Rheem organization.

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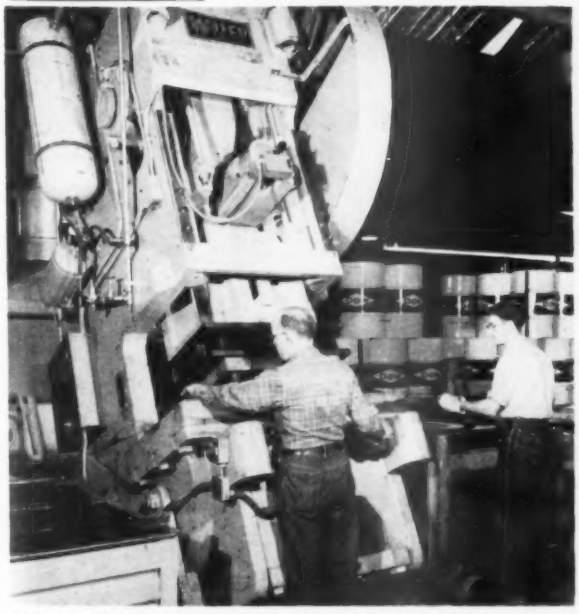

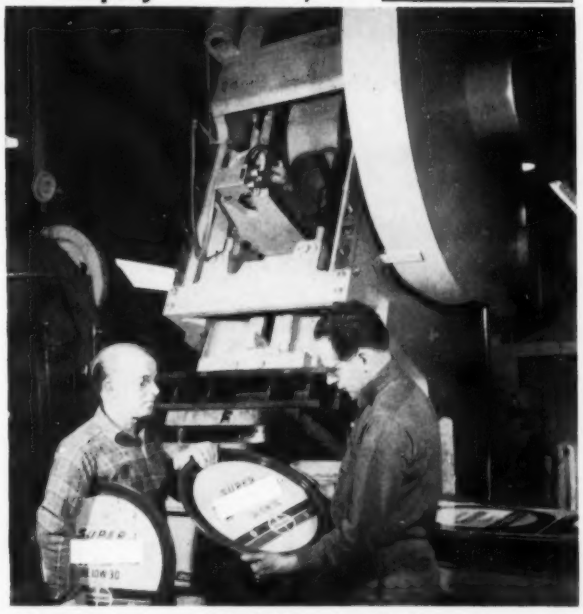

Warco 200-OBI Presses stamping out drum heads. Dozens of other Warco Presses are used by Rheem for all phases of presswork from appliances to ammunition shells.

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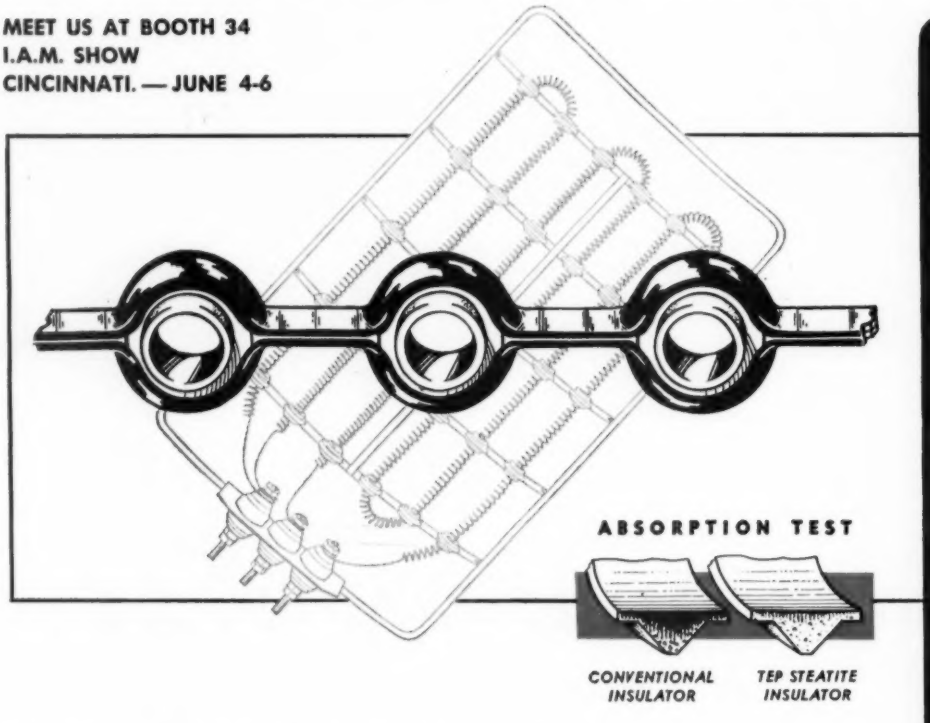

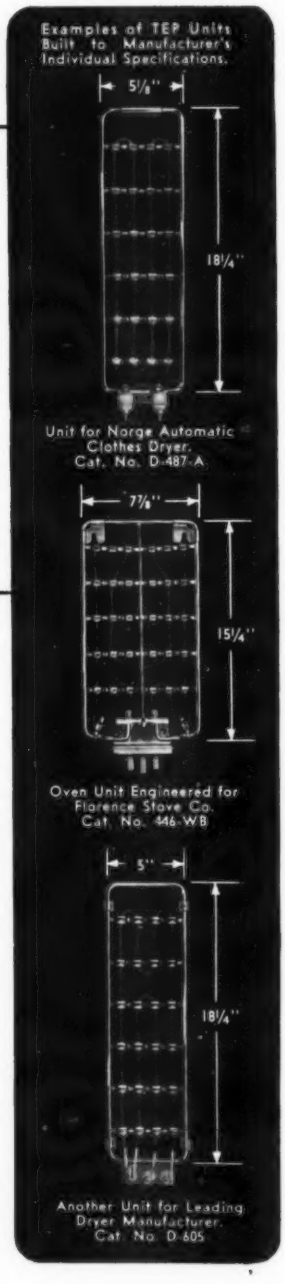
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Architectural Metal Manufacturers meet

RICHARD BIGGS

ARMCO'S BILL WITHEY

hold annual convention at Bellaire, April 12-17. *finish* editor reports on hi-lights of non-ferrous division meeting with comments by the speakers.

by Dana Chase, • FINISH EDITOR AND PUBLISHER

THE National Association of Architectural Metal Manufacturers with headquarters at 228 North LaSalle Street, Chicago, Illinois, held its 18th Annual Convention at the Belleview-Biltmore Hotel, Belleair, Florida, April 12-17, 1956. The Association is made up of three divisions: Iron and Steel; Non-Ferrous; and Tablet and Letter Division. In addition to the general meetings of the Association, each division has its individual officers and independent meetings.

In dropping in on the convention of NAAMM, your editor was interested to find the focal point of formal presentations to be the subject of curtain wall construction.

While there are at least three major competitive materials for curtain wall construction included under the program of NAAMM—stainless steel, porcelain enameled steel, and aluminum (with porcelain enameled aluminum gaining some attention) — it seemed very evident from the meeting that those whose primary interests are in the production of metal curtain walls and other similar products appreciate the importance of cooperation by the various segments of the metal fabricating industry against the common competitor of conventional ceramic type building products.

Speakers stress co-operation

As we heard speakers representing steel, stainless steel, aluminum, etc., we heard a continuance of the theme of "cooperation" and the continued urging of more comprehensive programs of technical research, market research, education and promotion that could well be of equal benefit to all segments of the metal fabricating and metal producing industry.

Richard A. Biggs, Crucible Steel Company of America spoke to the group on—"Overcoming the Problems of Using Stainless Steel in Architectural Applications."

In the early part of Mr. Biggs' talk, he painted a background showing a lack of sufficient industry-wide information of both a technical and general nature relating to the problem of using stainless steel for architectural purposes.

Problems to be overcome

In referring to problems to be overcome in the use of stainless steel for architecture, he referred to: (1) price; (2) information (education); and (3) service. Biggs stressed the fact that in connection with price, he was not referring merely to the price of the material but was taking into consideration "installed cost." "No building material has ever been used competitively without adequate design and fabrication experience," he pointed out.

Biggs puts great emphasis on "information" — which includes handbooks, reprints. "All kinds of technical and general data," he said, "are of extreme importance both to guide proper use and to avoid misuse."

In connection with service, he suggested the following check sheet to the group: (1) Have material on hand (proper timing for installations), (2) More detailed data on types of material, (3) More information on fabrication techniques, and (4) Elimination of any on-site fabrication.

W. H. Withey, Armco Steel Corporation spoke on "Opportunities for Market Development Through Trade Associations." Withey urged the association to expand product development and market research and to consider cooperative promotion on an industry basis. The benefits to be derived, he pointed out, were (1) The force of industry effort concentrated for greater benefit, (2) An accumulation of the individual talents of individual companies for the common good, and (3) The economy of eliminating duplicated efforts.

Withey recommended that the association set up committees on market research, on product analysis, and on promotion.

In his talk, Withey cited results of a similar program by the Porcelain Enamel Institute. He pointed out that in slightly over ten years, an infant industry of porcelain enameled steel in architectural applications had grown to an estimated $40,000,000 market in 1956.

Beauty in architecture

Topic of the speech by Robert K. Posey, Skidmore, Owings & Merrill, was "Aesthetic Value of Materials in Architecture." "The architecture of any age," says Mr. Posey, "is dependent upon the available materials and the current social structure." As has been indicated in earlier reports of Mr.

to Page 70 →

ROBERT K. POSEY

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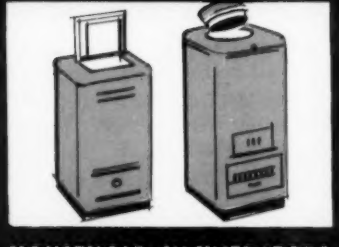

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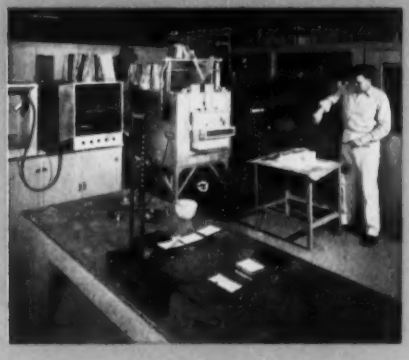

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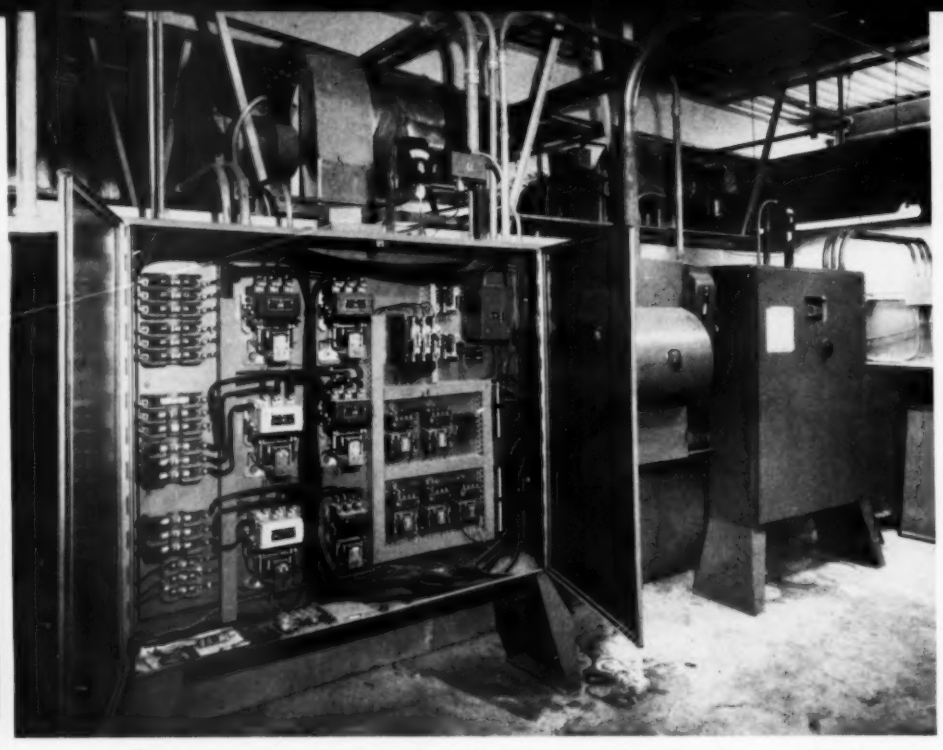
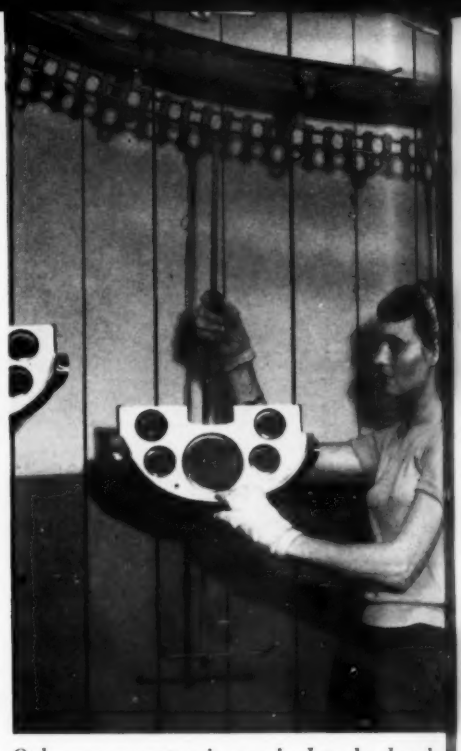


Heart of system is this control panel, floor mounted, and easily accessible for maintenance, housing separate electric controls for both water dry-off oven and paint-baking oven. Five-stage washer unit controls are in the cabinet at right.



Only one operator is required to load and u parts on this conveyor on which 380 parts c painted per hour in any of five different c

PHOTOS COURTESY JENSEN SPECIALT

How conveyors and equipment can minimize finishing costs

metal preparation and finishing—380 parts per hour with only two operators—the result of a complete plant modernization program

THE Congress Die Casting Division of the Tann Corporation of Detroit manufactures completely painted assemblies. Among the company's customers are some of the largest appliance and automotive producers. Because of sky-rocketing cost of labor in Detroit—as much as 50¢ higher than in some other parts of the country—this medium-sized corporation faced the problem of plant modernization in order to maintain a competitive cost picture.

Must modernize to live

Herman Tann, company president, had this to say about today's competitive manufacturing situation: "Old fashioned grocery stores are fast disappearing before the growth of supermarkets. Obsolete methods and planning will do the same to small factories".

In line with this philosophy the company has installed a painting system that requires only two operators yet paints 380 parts per hour in any of five colors. So successful is this phase of the modernization program at Tann, that rejects from the line are only 1%. Rejected parts are reworked and run through a second time.

Editor's Note:

In setting up an automatic painting system, small corporations may have specific problems regarding metal preparation and painting unlike those of this example. Leading equipment manufacturers will usually design and custom build a system that will conform to existing plant layout and production requirements.

Many small and medium size corporations that are encountering competition from larger companies, or companies with modern processing and handling equipment, may consider this example represented by the streamlined Tann installation worthy of study.

The modernization program included the installation of an automatic baking system, with the finish application set up to use electrostatic spraying at two points during the operation.

One of the two operators used in the system loads and unloads parts at the conveyor, while the other sprays on the finish coat. Color change of the parts is accomplished automatically and takes about 30 seconds.

The operation starts and finishes at the same point. Parts are carried through

the complete cycle by 535 feet of continuous conveyor at an average speed of 10 fpm with a 7 to 1 speed variation. This is a two-feet-per-minute increase made possible by experimenting with temperature and spray gun settings. On some jobs work carriers on the conveyor transport two parts each.

Explanation of cycle

The cycle begins with the parts entering into a five-stage washer. In this section parts are cleaned, rinsed, phosphate coated, rinsed again and, finally, chrome rinsed.

Parts then proceed through a two-pass water dry-off section of an infrared oven. Heat comes from 2000 watt, sheathed resistance, rod type heaters and 30 kilowatts of radiant heaters in convection air heater box. Parts dry off in this section for four minutes at 212°F. before moving on into a spray booth where a primer coat is electrostatically applied.

Final spraying set-up

An operator hand sprays a finish coat on the parts in a conveyorized, on-the-line spray booth. Final coat is then applied electrostatically. This electrostatic unit employs two spray guns instead of the single spray gun used for the application of primer coat.

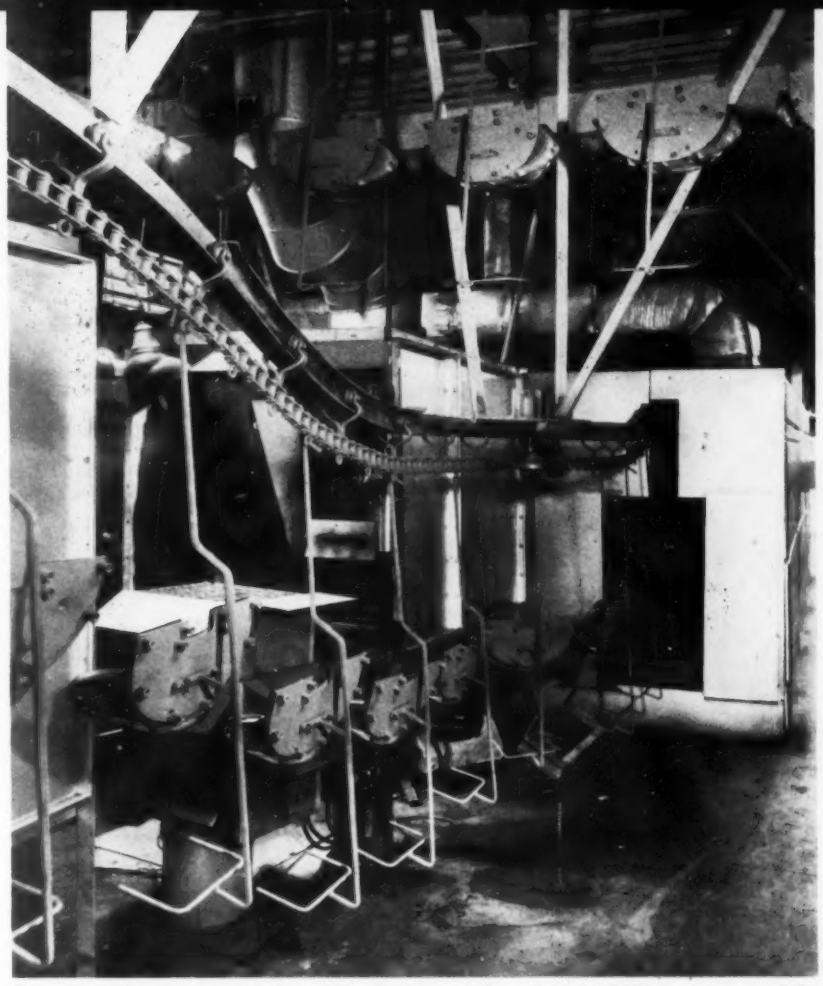
The part now completely painted enters the paint baking section of the infrared oven, a six-pass compartment. Ninety-six kilowatts from 200 watt radiant rod type heaters and 30 kilowatts of radiant heaters in a convection air heater box generate 300°F. Actual baking time — 12 minutes.

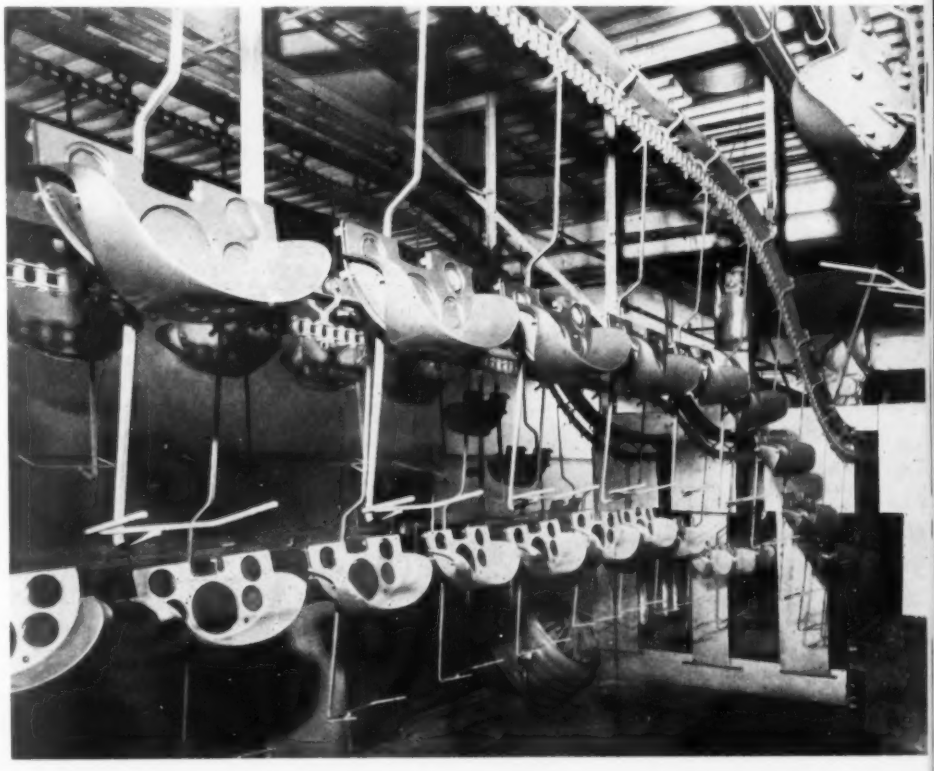
Dry-off — baking system

The dry-off oven and the paint-baking oven are separate and have separate air-recirculation and exhaust systems even though they are in the same housing. They are divided by a sheet-metal baffle.

After baking, the conveyor transports the finished piece back to the starting point for unloading. Should any part of the system fail, controls automatically shut down the complete operation.

On some types of automotive interior parts an additional coat of flat lacquer goes on the painted piece to prevent glare. This represents an additional step which is not a part of the automatic cycle.



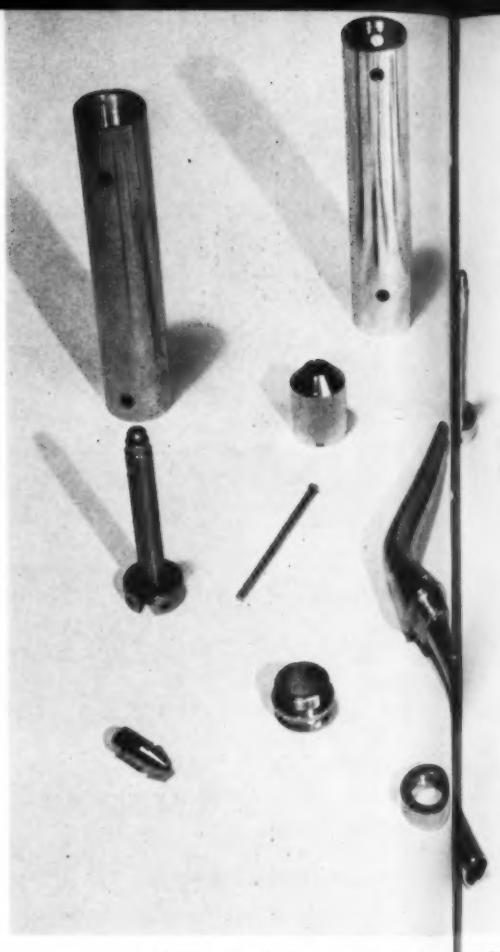


Parts are then processed into this five-pass infrared paint-baking oven used by the Tann Corp. of Detroit, Mich. Paint is baked on at 300° F. for 12 minutes. Below, shows parts entering the water dry-off section of the oven (lower left), and leaving the five-pass paint-baking oven as shown at upper right of the photo.

How you can brighten stainless steel parts by electropolishing

economies of electropolishing in particular cases detailed out—and system explained by author

by W. E. McFee • SUPERVISOR, PRODUCTION INFORMATION SERVICE, ARMCO STEEL CORPORATION



Some of these *small stainless* [illegible] *practic electropolished parts would have* [illegible] *hods*

ELECTROPOLISHING was not designed to replace buffing and plating. These are frequently best suited for flat or plain surfaces. Where electropolishing does its most effective work is on surfaces broken up by embossing, perforations, radii ribs and other irregularities. The process gives a high luster to stainless steel. It is the reverse of electroplating where the work is the cathode and metal is added. In electropolishing the work is the anode and metal is removed.

Experience has shown that electropolishing is a valuable addition to mechanical polishing methods. Many products that have been too costly or difficult to polish by abrasives or barrel polishing are now being cleaned and brightened to a lustrous finish at reasonable cost.

A few examples of these are: (1) Regular or irregular parts formed or drawn from sheets or strip. (2) Intricately formed wire products. (3) Resistance-welded wire products, a process that also remove spot weld discoloration, (4) Parts too small to hold against wheels, (Here it also removes slight burrs) (5) Deeply recessed and complex parts, (6) Forgings, and (7) Castings.

Reduction in metal loss

Metal loss is much less than in mechanical polishing. Only 0.001 to 0.002 inch is removed, according to the nature of the surface. Uniformly good results depend on starting with smooth, dense surfaces free from scratches and tool marks. Cold-finished stainless steel is always desirable.

Electropolishing lends itself to all types of stainless steel, but most suitable are the chromium-nickel grades. Type 302 is an example.

Unit is simple operation

Operation of an electropolishing unit requires no special skill. The simple principles are easily learned and the process needs little or no supervision.

The two most successful methods have been widely used for some years. Each has its own advantages. Method One[1] uses either (a) citric-sulfuric acid or (b) Glycolic-sulfuric acid for electrolyte. Method Two[1] uses phosphoric acid-Butyl alcohol.

Both A and B in Method 1 have been in continuous operation for over fifteen years. Method 2 is effective but the solu-

[1]editors note: details on these, pre-mixed for use, and the royalty-free use-rights will be supplied on request.

Two conventional *methods of hanging cathode strips. Lower arrangement is designed for added flexibility.*

Suggested procedures *for handling two types of materials are shown in the below drawings. At left are racks with pinch type "V" hooks, used for parts made of wire or rod. 3-row rack is for batch electroplating small parts.*

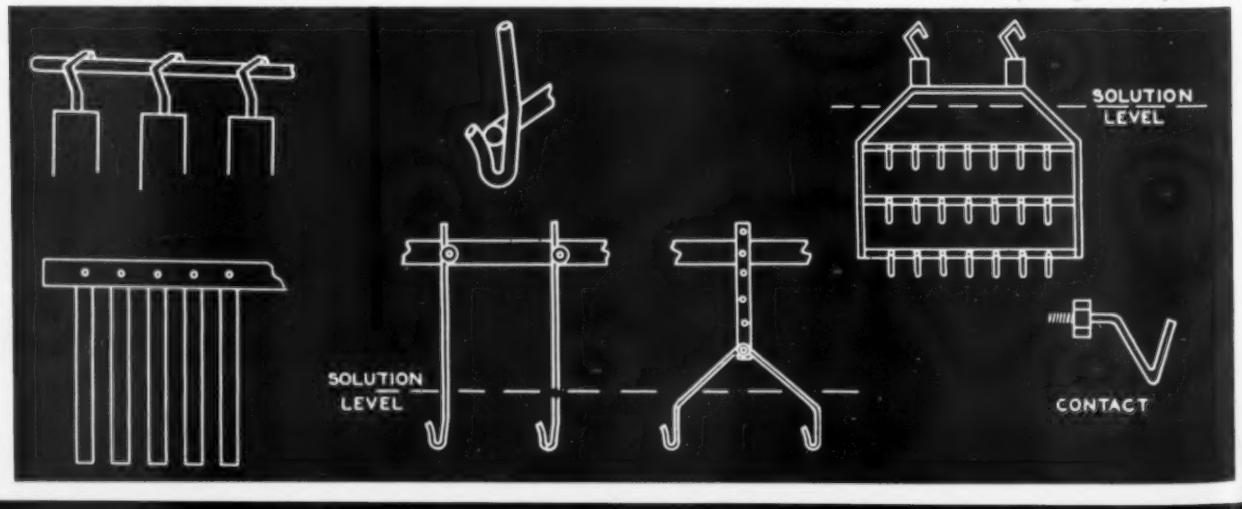


Photo: courtesy Armco Steel Corp.

inless practical to polish by mechanical
have methods because of size and intricity.

tion must be discarded when the metal content interferes with polishing results.

Necessary equipment for operation

Equipment consists of a low voltage direct current source (6 to 12 v.), a tank for the electrolyte, temperature control for electrolyte, holding racks, proper cathodes for the requirements, and rinse tanks. The circuit should include an ammeter and rheostat for current control.

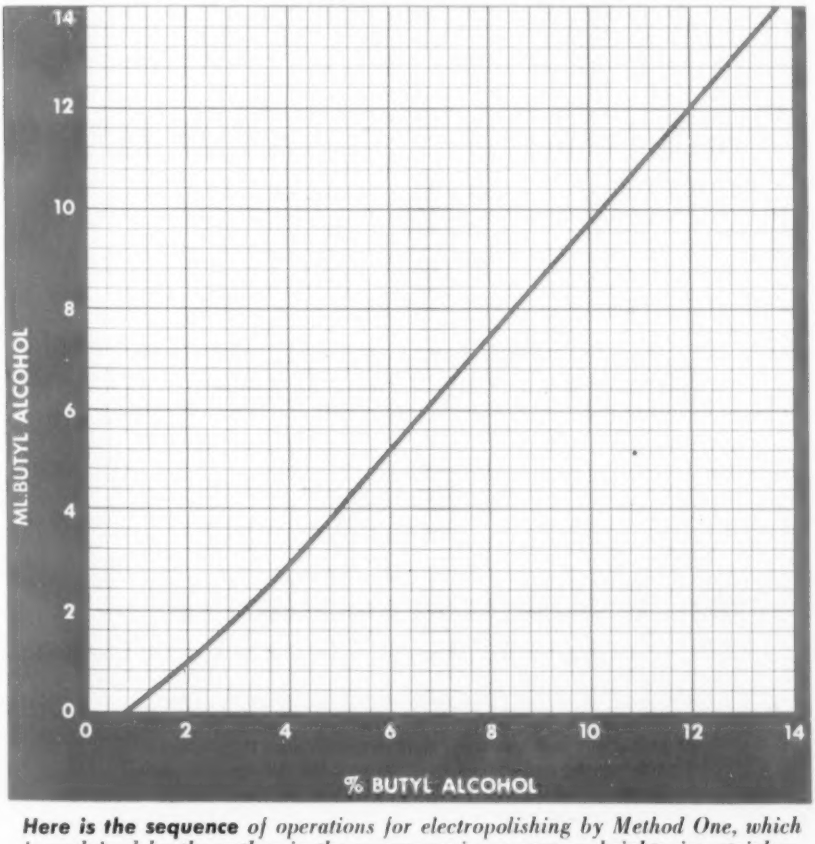
The article to be polished is made the anode by connecting it to the positive current lead with clamps or holders; then immersing it in the electrolyte so that all parts of the anode are from ½ to 1½ inches or more from a cathode element. The negative location of the cathode elements in relation to the work helps produce a uniform finish.

Creating the desired brightness

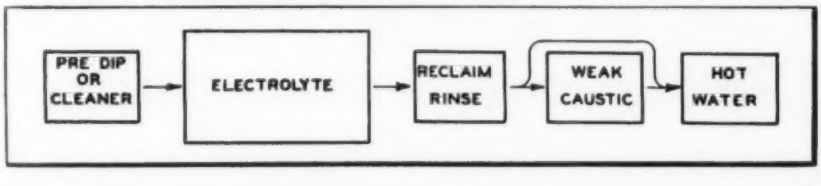
Time required to produce the desired brightness depends on the original finish, current density, bath temperature and shape of the part. A bright, even finish usually may be obtained in 2 to 10 minutes. This of course depends on

Brown & Sharp Gage No.	Wire Diameter In Inches	Area in Sq. Inches per Linear Foot of Wire
22	.025	.95
20	.032	1.2
18	.040	1.5
14	.064	2.4
10	.102	3.9
⅛" round	.125	4.7
7	.144	5.4
6	.162	6.1
4	.204	7.7
¼" round	.250	9.4
1	.289	10.9
1/0	.324	12.2
2/0	.364	13.7
3/0	.409	15.5
½" round	.500	18.9

Current requirements *for electropolishing is determined by the total area to be polished. All surfaces must be considered when calculating the area of a part. Threading or knurling, for example, will increase the area markedly. The above chart will aid in making computations. Below, the conversion chart for fixing percent of butyl alcohol in phosphoric acid-butyl alcohol solution.*



Here is the sequence *of operations for electropolishing by Method One, which is explained by the author in the accompanying report on brightening stainless.*



the starting surface and use of the recommended range of current densities. Where the original surface is rough, treatment time may have to be lengthened to achieve the wanted luster.

Over-polishing can in no way injure the surface. Metal loss is only about 0.001 inch in a ten-minute exposure at 1 ampere per square inch. This can be accelerated by increasing the current density.

If the work is reasonably clean, no pretreatment is necessary. Yet grease and oil and other deposits should be removed with an alkaline cleaner or degreasing unit to minimize foaming in the electrolyte. Fabricating lubricants such as lime, copper, lead and cadmium must also be removed.

Normal operating practice

Normal practice is to heat the electrolyte by electrical immersion heaters or steam coils. This way heat generated in the solution will help to maintain the bath within the most efficient operating temperature range. In some cases heat must be dissipated. The useful way to do this is to introduce cooling water through the steam coils with a 2-way valve. Sometimes cathodes can be relocated to reduce heat generation.

Recommended operating temperature ranges for the three most commonly used electrolytes are: Citric-Sulfuric Acid Solution . . . 180 to 200 F. Glycolic-Sulfuric Acid Solution . . . 170 to 190 F. (duPont Solution) Phosphoric Acid Butyl Alcohol Solution . . . 120 to 160 F. *Notice: These solutions are non-explosive.*

Cathodes — types and uses

Cathodes can be lead, copper or stainless steel wire, strips or perforated metal. Or sometimes the tank itself will be an acceptable cathode. For electropolishing units up to 500 gallons capacity, cathodes are frequently made of ⅛″ by 1″ metal strips. For most efficient operation, larger units are best equipped with ¼″ by 3″ strips. The strips are hung vertically in the bath and can be adjusted as needed. Copper or lead cathodes are used with Method 1; lead, copper or stainless steel with Method 2.

When polishing deeply recessed pieces, such as cups or extremely irregular shapes, it is often necessary to employ inside and conforming cathodes for each individual part. These are shaped to apply uniform current density over the entire area to be electropolished.

Suggestions on processing

Racks are the answer to numerous small parts that can be conveniently hooked or clamped and polished in batches. Larger parts may have to be hung individually. When continuous production equipment is used, parts are clamped to a moving electrode system and loaded and unloaded continuously, similar to electroplating practice. The exact set-up is dictated by the nature of the work to be electropolished.

Generally, special procedures are not required. Simply hang the work in the tank with adequate contact and the parts will polish effectively. Racking practices and current distribution are like those used in electroplating in a chromium bath.

Where it can be used, the electropolishing process does away with the threat to health of dust encountered in mechanical polishing. The only consideration is enough ventilation, especially in restricted working space.

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COLOR: White (available in colors)

APPLICATION: Spray; manual, automatic, or electrostatic

BAKE: 20 min. at 325° or equivalent

GLOSS: High, 90 plus or minus 2

HIDING: Excellent, solid, one coat on steel

FLEXIBILITY: Good

ADHESION: Good to steel, primer, or spot repair

HARDNESS: H pencil

RESISTANCE: Excellent to detergents, humidity and salt spray

COLOR RETENTION: Good for light or overbake

RECOMMENDED FILM THICKNESS:
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Exciting developments are under way that could literally double the size of the Porcelain enameling industry in the next five years. A few of them are listed on the pointed ends of the arrows above. For information on any or all of them, please write...

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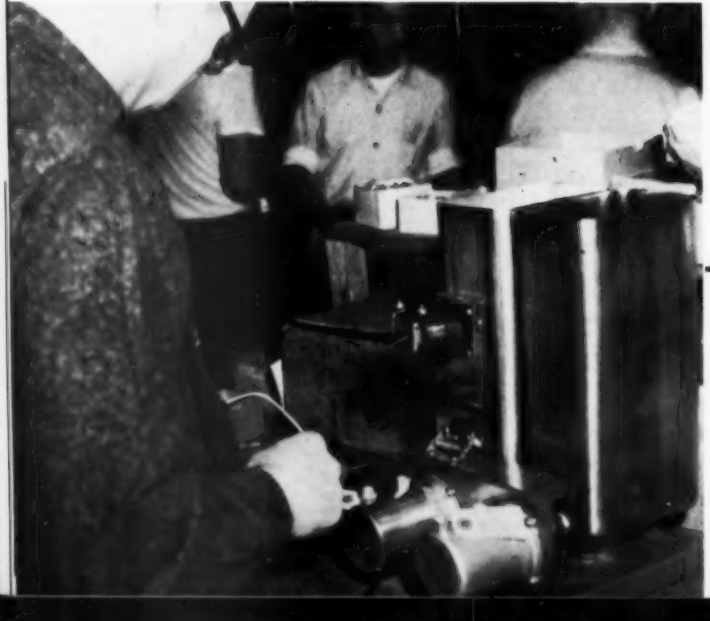
Engineerind

A machine that vends coffee, made just like your wife makes yours at home, is an excellent idea—and one that automatically closes up shop and washes itself off when business is light — then turns itself on, makes a fresh pot, and serves it up at the drop of a new dime — is strikingly phenomenal. Here's the first report on the machine that does all this, and more — the Perk-O-Fresh Coffee Machine.

Assembly of the Perk-O-Fresh *is done on a single line at the Chicago plant of United Coffee Corp. Movement along the line is done on the machine's own wheels with the sequence planned for series movement rather than continual flow of the machines. Here, in one of the steps in the line, the appendages on the case front are attached. Details of the case and the all important percolator wheel can be seen here as well as the "coffee warmer," that box of stainless steel immediately behind the workman's back, which is electrically heated to a constant temperature.*

How the wheel goes *is shown in this photo. Note the three small wheels on which the larger percolator wheel turns. Workman is making the first adjustments on the electrical components which control the movement of the wheel as a new percolator of coffee grounds is brought up for use.*

All photos in this feature are finishfotos



Details of the component *that handles the sugar and powdered cream are visible here. The two stainless steel containers, the vibrator for assuring no "build up" in the cases, and the twin motors that drive the stainless steel screw augers to provide — and measure — sugar and cream in the correct proportion. Operation here was taken in the sub-assembly section where this part is made up with three separate operations.*

...nd assembling the "Perk-O-Fresh" coffee vender

here's the engineering and assembly details on a vending machine that makes real coffee in sixteen percolators—a photo story with details to show you how it's accomplished

Exclusive feature

finish

A PLEASANT INVITATION to a real cup of coffee is the creation of the United Coffee Corp. of Chicago, who with their Perk-O-Fresh coffee vending machine — "The Machine that Percolates Its Own Coffee" — has made the whole industry of venders perk up to the advancement in coffee, hot tea, and chocolate dispensing.

Providing a unique opportunity to let employees know, while new Perk-O-Fresh units are being fabricated into shape, just what they are making, operating units strategically located around the plant, perform two duties, carrying out test procedures and experimental work, while providing a ready supply of coffee — hot and fresh — to answer employee needs.

The Perk-O-Fresh machine is now in full production. Also, facilities for supplying the unit throughout the United States are expanding carefully but rapidly. Actually, the machines have had quite an extensive test out. One aircraft factory on the West Coast, for example, is the proud possessor of ninety (90) Perk-O-Fresh machines, providing 28,000 cups of hot coffee daily to employees.

Service man training *starts right in the manufacturing operation where field men work alongside the assembliers so they can have full knowledge of unit's interworkings. Here Company President Paul Rosenbaum makes some check-ups on how the training program is progressing. Below, start of the sub-assembly with the cup dispenser being put together.*

Began at breakfast table

While this Perk-O-Fresh machine is completely new in design, actually it is the grown-up brother of six percolator units, dreamed up by Corp. President — Paul Rosenbaum, and Treasurer — Leslie Arnett, at their breakfast table, and manufactured earlier.

The new machine developed by Arnett in cooperation with Chief Engineer William Friese operates on the same principle as the early 6 percolator unit. It has 40 percolators, however, of proportionately smaller size providing always fresh coffee and built-in "customer satisfaction".

A visual picture of the machine's interworkings is on the following page. However, much more can be said about its operation. The unit, 76″ high, 32″ wide and 23¾″ deep, is a wholly contained unit, requiring only a regular cold water lead in and a standard 110 watt electrical outlet.

As can be seen, the forty percolators of the machine are free floated on a 14 gauge stainless steel vertical wheel. Each of the two-piece percolators — measuring 3½″ in diameter and about 7″ high — contains a packet of coffee sufficient to make 16 cups of coffee. As directed by the automatic timing and control devices, a fresh unit swings up to the highest point of the wheel.

Here, a self-sealing, by pressure, hot water outlet is

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Clean-up *is a continuing operation at the plant with each machine getting a thorough over-haul check before being okayed for installation and/or shipment to customers.*

Electrical Panel *for the machine is supplied, but all wiring is done at the plant. Here the master control panel is being put together. When it is completed, it is housed in a stainless steel cabinet unit. When installed only the lead-in wires are exposed and these are quickly connected up.*

ENGINEERING CONTINUED

automatically brought down and a measured amount of water — preheated to near boiling temperature is forced down through the coffee grounds and into the coffee warmer below, the source for vending. This is the basic operation of the machine and the sequence pattern.

Additional details on the water heater plant, the operation of the machine and vending principles are detailed in the assembly report below.

Manufacturing the Perk-O-Fresh

Complete assembly and wiring of the units is done at the West Huron facilities in Chicago of United Coffee Corp. Fabrication of parts and the brown baked enamel case is accomplished by outside contractors according to the corporation design specifications.

The unit case and swinging door of 14 gauge steel is supplied as a single unit to the plant with no signature or display plates attached. These are supplied by a local lithographer who prints on plastic sheeting. Wiring is purchased by roll, and the company, who do all their own wiring also mark and code from the provided rolls. The heart of the unit, the electrical control compartment, is provided, but all wiring is accomplished by the company sub-assembly line electricians.

Sub-assembly operations

The cup dispenser unit is sub-assembled in one operation with the company designed additions placed upon the patented cup dispenser. The eight sleeves that hold the cup supply are also inserted. Of stainless steel, they are bracket attached, providing for immediate easy removal for refilling.

Spot welding of the electrical leads is also accomplished, and the finished section is supplied so that only attachment of the lead-in wires and attachment to the case is all that is required in final assembly.

Two separate operations are required to assemble the Perk-O-Fresh cream and sugar units. The two stainless steel containers — each with a 16 pound capacity — are received at the plant in finished condition.

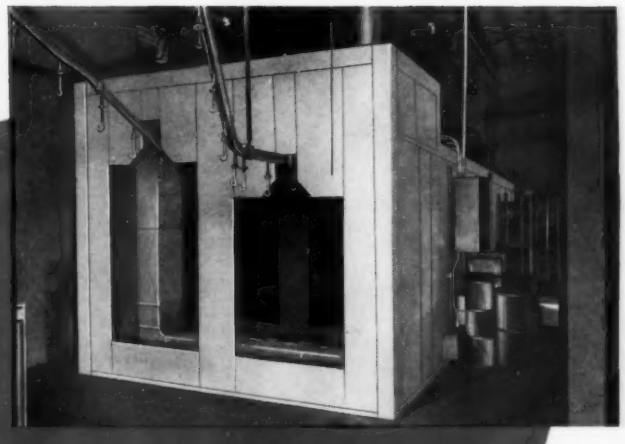
At the bench operation each container is equipped with a stainless steel worm screw running along the bottom of each container. These are attached to an individual 1/16 hp motor which — with relay support — dispenses sugar or cream in a predetermined amount. Even these feed screws are the result of special engineering, with the bottom cores rounded to eliminate "stick-up" or clog.

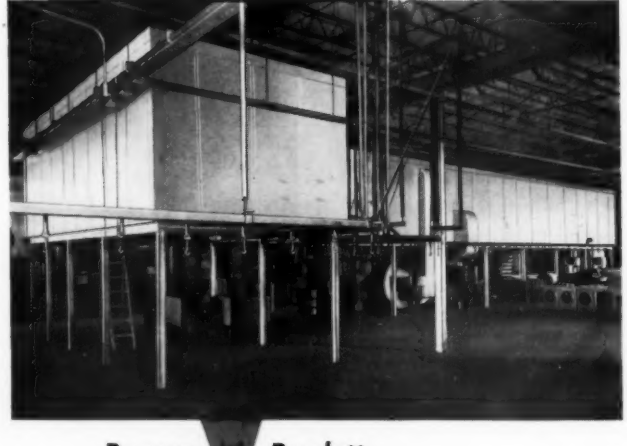
Moreover, the containers are equipped with an electrical vibrator which works momentarily each time a cup of coffee is dispensed, rapping against the containers to prevent "hang-up".

Another vibrator is used on the stainless steel chute

Sub-assembly *of the cream dispenser. Some 18 feet of plastic tubing is used in each asembly. Here plastic tubes are connected onto the 16 pound containers, made of stainless steel. Later, another sub-assemblier will install the screw conveyor system as well as the two vibrating units for sugar and cream dispensing.*

BURDETT'S
"Famous Name" of the month is "Magic Aire"





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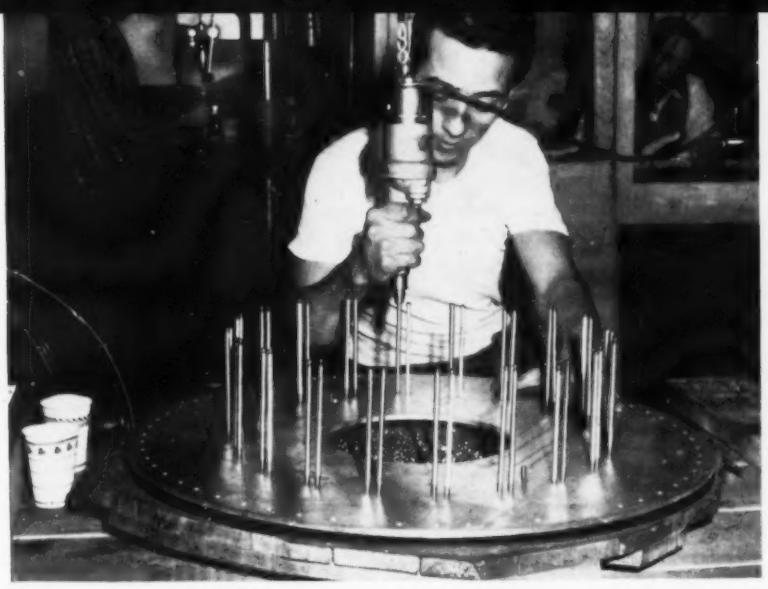
Manufacturers of
COMPLETE FINISHING SYSTEMS — "RADIANT-HEAT" SYSTEMS, OVENS, HEATERS, AIR MAKE-UP UNITS, SPRAY BOOTHS AND WASHERS

***Inventor Arnett** looks over one of the test machines which continually are in use as a guinea pig for new ideas in coffee vending.*



***Key unit of the machine** is this stainless steel percolating wheel which moves the 40 coffee pots into position as needed. Made of stainless steel, there are more than 200 separate parts needed in this sub-assembled unit. Wheel turns on three sprocket wheels—visible in the photo on the introductory page of report.*

ENGINEERING CONTINUED

which guides the sugar or cream from the container into the cup. This vibrator speeds the gravitational flow of the granular material assuring its deposit in the cup before the purchaser withdraws it.

There are more than 200 separate parts in the coffee wheel, including the 7″ long 5/32″ brace screws, the pre-stamped 36″ diameter stainless steel wheel and the necessary brace locks.

In the assembly of this wheel the first step is putting the back wheel onto a jig to assure proper and exact job stamping parts, etc. After this, the sub-assembler first attaches the triple circle of brace bolts.

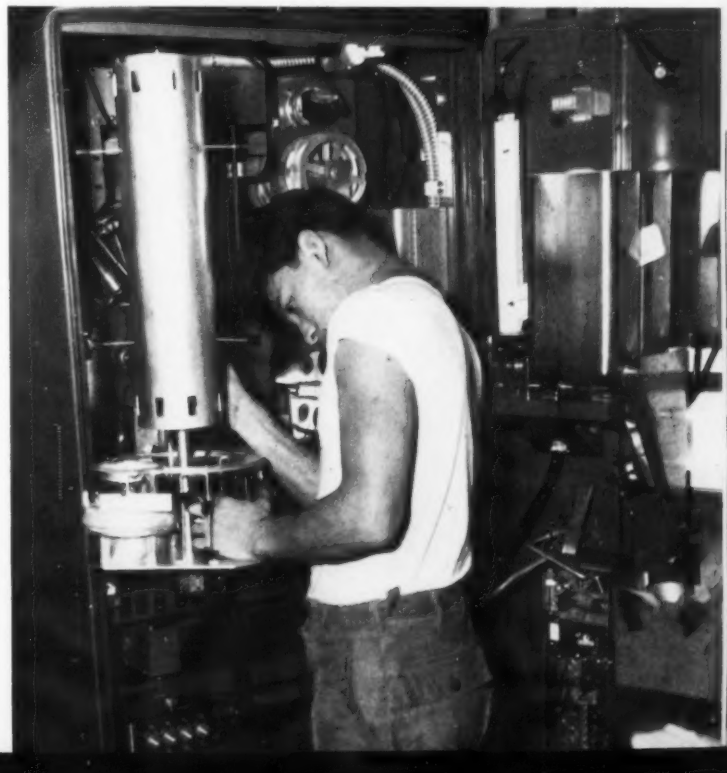
The brace bolts are so situated — and the percolators fabricated — that the percolators free-hold in their proper areas and are readily pulled out for replacement without need for any type of lever releases. When this operation is completed, the whole unit is ready to be bolted into place on its sprocket, attached to the weight wheels and electrical controls in the final assembly.

Assembly of the hot water tank

The 3½ gallon capacity hot water tank is assembled by first wrapping the stainless steel unit with insulation, binding it together with tape and inserting it into the brown enameled case. The double set of controls — two sets are used to provide absolute safety, no matter what the situation — are then attached, and the copper piping and electrical wire in pre-determined lengths are added so that all the final assembler need do is make the hook-up.

Back in the wiring department, the control panel has been completely wired, and the series of switches needed

***Assembly is done** with each man responsible for one or more particular sub-assembled unit. Here the cup dispenser, earlier shown in assembly, is being screwed into place in final line. Next operation is setting up the wiring and hooking up the several different electrical units in the machine as shown in the picture below.*



to operate the unit are attached. The coin exchanger has also been assembled in a flat case ready for attachment to the final product.

At the point of start, the cabinets received from the contractor are fitted with the steel plate sprocket and the turntable mechanism for operation. Also attached is the inside light, the basic fixtures needed for installation of the various composite components. The units move along the final assembly on their caster rollers.

The control panel is then installed and the wiring left for later attachments during each final operation. One man takes care of the installation of each hot water tank and its hook up. A waste tank requires only a brace piece, and this piece is installed, and the unit moved on.

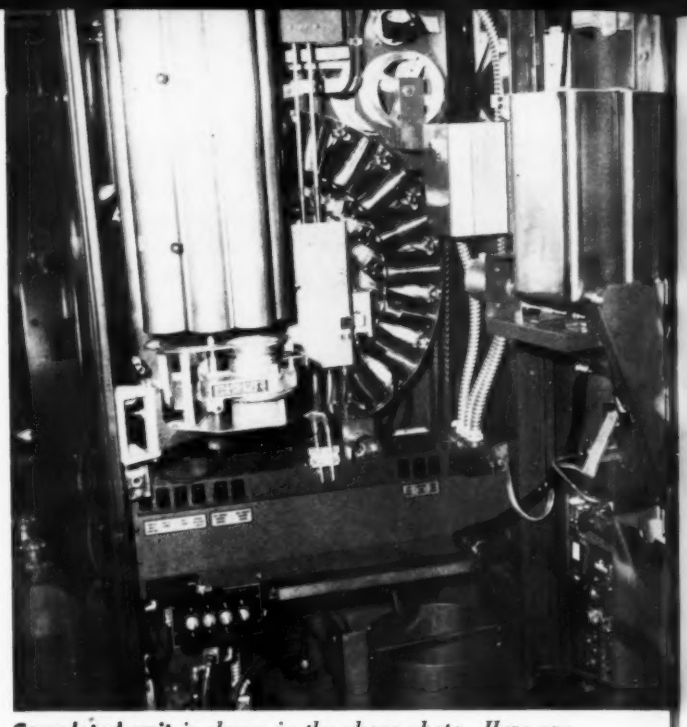
After the remaining parts, earlier reported on, are installed, the units move into the final section where electricians go over each connection, testing out operation from the electrical control board.

The unit is then hooked up, set into operation with coffee and hot water to assure perfect operation. Time cycling is also checked simultaneously.

Serviceman's school right on line

The management is aware of the need for adequately trained servicemen, and so, in this final testing section, the company also trains service men who will operate in districts across the nation. By the time they have completed the course, they are as familiar with the product and its operations as the line inspectors in the plant — with every section, from cup dispensing to electrical trouble shooting.

Finally approved, the machine is thoroughly cleaned,



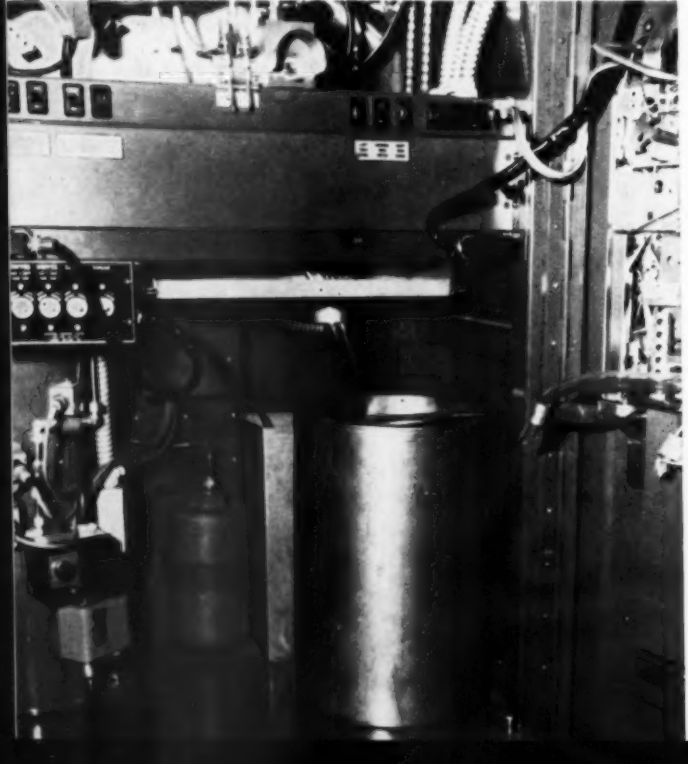
***Completed unit** is shown in the above photo. Here can be seen the wheel in place with the inserted coffee pots, the sugar and cream vending units on the doors, and the control set up for operation of the unit.*

by means of vacuum cleaners, etc. The final check-up man then goes over the unit once more, putting it again into operation. Then the machine is ready for shipment.

Worthy of note, is the excellence of materials that go into one of the Perk-O-Fresh machine. No photo can show the hospital-like cleanliness of the completed unit. Excellently made, the results are better operation, minimum repair, and the elimination of that "out of service" sign familiar to all of us.

The Perk-O-Fresh unit has now been equipped for hot tea, which, to the surprise of management, has had unusually good response. The tea unit is the same as for coffee, requiring only proper amounts of tea inserted, replacing coffee grounds, in the percolator piece.

***Bottom section** of completed unit. Note the plastic tubing used extensively throughout the unit. Large stainless steel tub is for drain off from the coffee warmer. Double controls on the water heater at right are to provide double safety. Unit needs only cold water hook-in and one 110 watt electrical outlet to be put into full operation.*



How United protects product reputation

United Coffee Corp., is the unit's manufacturer — Interstate-United Coffee Corp., is the exclusive licensed operator, in the United States, in cooperation with affiliated companies. Interstate-United's Chairman of the Board Paul Rosenbaum, and Interestate-United President Ronald Wolff assert that this method was developed because of the protection it gives the company for the quality of its machine's product.

Coffee, carefully selected, is used and coffee of the same quality as you find in the plant's own units can be found in even the most distant installations. The coffee is packaged in filter paper bags daily and inserted in each percolator by the local operators. Percolators are replaced with duplicate fresh coffee percolator pots, and the used ones are returned to the central point for sterilization cleaning and refilling.

Interstate-United Coffee Coporation has it's home office at:— 1015 West Congress Parkway, Chicago, Illinois; and has at the present time more than twenty-five (25) operating branches and affiliates from coast to coast.

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71-D prevents rust spread and rust blisters

A MACCO CASE HISTORY*

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*Actual case history, names, etc. can be had by writing today to

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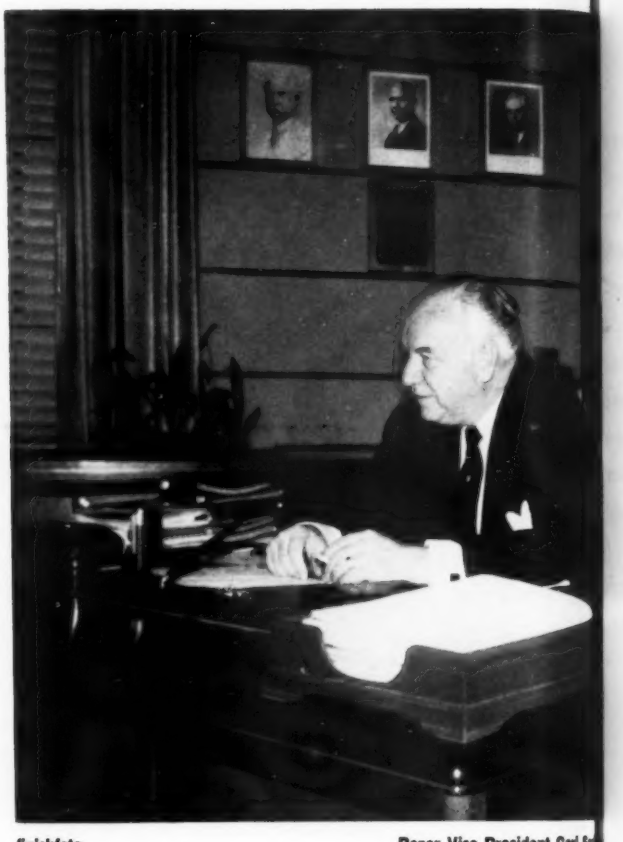


finishfoto — Roper Vice President Carl So

by Charles R. Sample, • FINISH ASSOCIATE EDITOR

Exclusive feature finish

The Geo. D. Roper Corp. down in Rockford, Ill., is a long time exponent of the important position that customer service holds in the appliance industry. What's more, they have been constantly developing their customer service program through the years until today it is a multi-faceted operation that penetrates far into every segment of customer and product servicing.

And, when *American Home* Editor Edith Ramsey pointed out in the April issue of *finish* that the most important part of appliance purchasing is the assurance of prompt and adequate service, Roper Vice President Carl Sorby was quick to point out that, while Miss Ramsey was aiming in the right direction, she should have added one very important phrase to her assertion.

"*Starting out with a quality product* was the phrase she should have added," Sorby says, "because it is a simple matter of physics that service and prompt repair can never create a product better than itself."

"I'm sure you are aware of the pride with which we produce our ranges and the quality of our products," Sorby points out. "And when you talk about service, Roper Corp. is not a 'Johnny come lately' to the importance and value of that, either. Can you remember 1934 when we produced and sold a range under the sales line 'The range you can service with a dime'? Well, that was the year that our present day customer service program came into being.

Automation ushered in new era

"The complexity of today's models has reduced greatly the simplicity found in that 1934 model," Sorby says, "but with the greater complexity of the new models, the housewife has been ushered into an era of automaticity — of cookery ease — that would have been unbelievable only a few years ago.

"That increasing automation — and added features — has come about step by step. And keeping pace has been Roper's service program until it is, today, a separate and important division of our corporation, taking its place alongside advertising and engineering in our present day sales force."

To this, Roper Service Manager Tom J. Reynolds is in full agreement. "Today's Roper Service Dept. provides a full blanket of protection for the sales department — for the integrity of the Roper name — and for continuous customer good will.

"Such a vast field of coverage did not come about in a day, either," Reynolds asserts. "It was developed as the automaticity of gas ranges grew in answer to the public demand for better, *more helpful* products."

Growth of Roper's service program

From its beginning in 1934, Roper's customer service program had continual growth as part of the company's sales department. By 1946, with the postwar surge of peacetime products incorpor-

Mr. Sorby, what's the relationship of service to sales?

"The best way I can answer that is to tell you about the one legged man who was asked if he ever wished he had his other leg. 'I don't need the other leg,' was his reply. 'What I need is both. For with one or the other, I'd still limp but with both I could stride as fast and far as any man.' What is the relationship of service to sales? 'I don't think anyone can deny that customer service is a part of selling — and that true salesmanship is, in part, customer service."

ating advances made in the tremendous strides by engineering and technology during the war, the service program was made into a separate department of the plant organization and it was at that time that Reynolds — with the company since 1934, and part of the service program since 1946 — was named department head.

Continuing its development, the customer service department reached such proportions that management constructed a separate building for its activities. That building, with 15,000 square feet of working space, was put into operation early this year.

It is the center from which the multiple services of customer relations and product repair services go out. Perhaps a good way to show some of the present day activities of the Service Dept. is to take particular subjects and outline them.

Training of sales personnel

The basis for adequate servicing at the customer level rests primarily with the field service managers of Roper and their associates. Six territorial managers cover the four primary territorial areas set up by Roper.

To insure adequate and proper instruction in the field, these managers, under the supervision of the company Service Dept., are trained to be as intimately aware of each separate part of the Roper package as are the engineers who create it.

Customer service starts with design

Even before the new product is approved for production, the field service managers have had a part in its construction for they must approve of the model before management will give it their okay. While still in a test model stage, the service managers as part of the Service Dept. program, have gone over the unit with a fine tooth comb — preventing trouble in the field before it is even created.

As the model goes into production, the territorial managers go through a complete "nut and bolt" schooling under the direction of the service department. In this classroom and laboratory study short course, the managers are acquainted with any developments in the product. They are given a run-through of the new literature and service brochures that have been prepared.

Individually, they service and repair a sample unit, test each component, and gain a thorough knowledge of adjustment and controls on the new line. The service representatives are also scheduled through the same basic program.

Then field force educated

By this means, the Service Dept, relays into the field all of this training and information because these representatives direct similar programs in their territories: they teach dealers and

Service Dept. Manager Tom Reynolds

Tom, why does Roper give a tool kit to each salesman?

"Did you ever go to a used car lot and have the salesman tell you how good this car rode, how easy it was to handle, how perfect its condition — and then, when he attempted to start the engine, he couldn't find the starter button? Well, our sales force — and our service force — know the product they are selling, how it works and how it is made. They not only can tell you how good the Roper Range is, if the situation merits, they can tear it apart and show you why. I wish you could see our file of letters from dealers who write thanking us for having a sales force that knows what they are talking about — salesmen who, with their little tool kits, made a customer a friend of her dealer — and made both of them friends of ours."

Roper President S. H. (Stan) Hobson

"Can you fix what you sell, Mr. Hobson"?

"Who knows how many dealers — and how many manufacturers' representatives — have been asked that question? Not I. But I do know of many instances where sales and friendships were shot down before they got into the air because the manufacturer's representative — or the dealer — couldn't answer that question in the affirmative. Our sales force can. And our service program is set up so that everyone in the line of march from the production line down to (and inside of) the kitchen can answer an immediate and confident yes. I cannot tell you how many satisfied customers are the result. I can't tell you how many Roper ranges that such knowledge and confidence have sold. But I can tell you that the number of both is tremendous."

dealer salesmen, service men, and interested parties.

That training is continually put to work throughout the year. Example: Take Jack McGinley, eastern division field service manager who has a territory covering one of Ropers largest and most concentrated markets.

Spends 75% of time in field

Jack spends about 75 per cent of his time in the field. That's 39 weeks every year on the road bringing regional sales representatives up-to-date, aiding in local and district service and instruction programs, being on-the-spot at shows and exhibits within his territory where people are on hand to hear "all about the Roper." And Jack is just the fella to tell them. He's-A-Sellin'-Serviceman. What's more, it's part of his duties to make spot runs with each representative, meeting the customers and dealers in each area, aiding representatives with particular products that seem too difficult for their handling.

That "Make Sales with Tools" kit

Add on to that the many times Jack has taken out his own tool kit and, analyzing a problem, made the repair on spot. That "Make Sales with Tools" kit is an interesting note. Roper prides itself in saying that every member of its field force can provide immediate trouble shooting and repair work on its lines. To aid them in this, each sales crew member is given a small but valuable set of tools as part of his sales kit.

Feeds back field reports

Jack McGinley has another job, too, that is very important. Every report from his representatives, every observation he has made, is bulletined back to the Service Dept. for immediate study. By compiling a continuing report on customer complaints, etc., the Service Dept. has been able, in instances, to spot a trouble spot on a particular model long before engineering has become aware of it.

Jack is also the voice with which Roper talks to its service representatives. And two to three times each year, he holds his own "nuts and bolts" refresher course for the Roper representatives in his territory. It's at these times that the field force is brought up-to-date on developments, bulletined in from the service department at the home office. More on those bulletins and data releases later. It is at these sessions that the reps have a session of their own, and the conclusions and observations of these meetings are also channeled back to the Service Dept. headquarters where they may, as they have in the past, become part of the next year's model.

At the dealer level, the penetration of the Service Dept. is shown as regular short courses are created for presentation either at Rockford or, if distance prevents, at centers within each sales area. Each division has its own service manager.

Whether at Rockford or in the area, the programs presented at these meetings are basically the same. Dealers are instructed on the new literature available and, during the special "nuts and bolts" session, given a first hand tear down and repair demonstration in which the dealers themselves participate.

***Set of Tools** — part of each sales kit is shown above with Service Representative Stan Fowler looking it over.*

***Even Texans** are kept up to date on proper servicing and repair procedures. In this photo, a group of Texans are being given the "nuts and bolts" course by one of Roper's representatives.*

Programs at Rockford are supervised by the Service Dept. In the field they are arranged and coordinated by the territory field manager with the Service Dept. backing them up, providing the needed literature, etc., he might need. In many instances, representatives of component supplying companies are brought in to explain the workings of the part they supplied in the Roper range, for instance.

Typical program of a session

Subjects covered during one of these meetings would include such as (1) proper burner adjusting, (2) theory of ignition system, (3) how to align an oven door, (4) procedures for ordering parts, (5) setting and operating electrical components. The dealers are also familiarized with the new sales and service literature — its salient points analysed in relation to the working model on which "study adjustments" are made to insure the dealers having full awareness.

Major reason for service calls

"The two major reasons for service calls are (1) incomplete instruction to the customer on the proper operation of the unit by the seller, and (2) improper installation," Reynolds points out. "These two factors are given plenty of broadcasting during our dealers' meeting.

"In a great majority of the customer complaint cases," he asserts, "the dealers could not only save time and money but be assured of customer satisfaction — most important to him as well as the manufacturer — just by making sure on these two points."

Reynolds' suggestion for dealers

"If part of the installation requirements for the service and installation crews were that they must spend just half an hour with the housewife after the range has been put into operation, answering her questions no matter how minor, explaining the operating manual with her, the amount of money and trouble saved would surprise the dealer."

"In that half hour," says Reynolds, "the housewife, in her own home, can go through the complete operation of her own range under the eye of trained instruction and, by such instruction, she will have not only a better appreciation of her dealers, but greater confidence — and so greater success — with her new range.

"In my opinion, such instruction — along with making the housewife aware of the value of her own instruction book — would reduce service and repair needs to a minimum," Reynolds asserts.

Roper's Service Department

We've talked about the Service Dept. at Roper. Here is how it is set up and operated. With Tom Reynolds heading the department, the division has three functions: to store, pack and ship appliance parts; to issue service information and publications as well as train dealer service personnel; and to act as coordinator between Roper sales and engineering in order to maintain the highest in service standards. Thirty-two people are needed to staff this section with the majority, *note this*, used in the parts shipment division.

Most of the earlier report tells of direct service activities of the department — training, educating, etc. However, Roper, well aware of these important factors, still believes that proper repair and replacement parts servicing is the most important part of its "Creating Customer Satisfaction" program.

Toward this end, the largest proportion of space in the new service building, and the by far greater proportion of the Service Dept. staff are directly concerned with parts replacement and repair.

Roper's system of parts filing

In the section, the company has installed a conventional bin-drawer system for the small parts. Large frame pieces are bin stacked in another section. To simplify searching through the numbered bins and aisles — and to insure prompt action and proper part selection — giant panels have been built up with

***Small Parts Packaging** is done in this section of the customer service building, with the small parts orders programmed through any one of the wrapping tables. Note "supermarket" carts used for gathering up "small parts" orders.*

ROPER SERVICE **CONTINUED**

the parts attached and, underneath, information and data, not only on the part's location but the model and style of the component.

For example: One panel shows all the oven thermostats used by Roper during the years, with a descriptive note under each mounted thermostat giving part numbers and the location of the bin where the thermostat is stored.

While Roper guarantees replacement for ten years, parts are kept on hand in a great number of cases for every range produced by the company since 1942. In addition, the dies for forming the frames, etc., are also stored, should it be necessary to make up a piece when the saved supply has been exhausted.

Method for inventory economy

This routine works for the later as well as earlier models, incidentally, as Roper management has found it more economical to put dies back on the production line to build up a short inventory, from time to time, rather than attempt to build up a huge supply for future years.

"Be sure it's the part that's ordered, and make sure that the part is properly packed for safe transit, are two phrases we never stop repeating to the service staff," Reynolds says. "Nothing can ruin a good customer-dealer-manufacturer relationship as fast as faulty parts delivered, or wrong parts delivered, or parts broken in transit.

Double check each parts shipment

"To assure such accurate shipment as this program requires, we have a double check on each shipment, first by the order picker — who goes around making pickups, incidentally, with a conventional supermarket basket on wheels. The order picker checks the model against the part, the part against the order. Secondly, as the shipment is made up, the packer checks the invoice against the part number, providing the additional service protection.

Proud of parts packaging procedures

"We're quite proud of our packaging," Reynolds points out, showing the array of different types of cartons, packing, etc., used in this operation. "For instance, we use polyethylene bags for small parts that could be lost or for components — such as controls — that may be receptive to dust." This type of package is also an aid to the dealer who can look through the supply on his shelves, checking for particular parts, or his own inventory, should the situation merit, and protecting his parts at the same time.

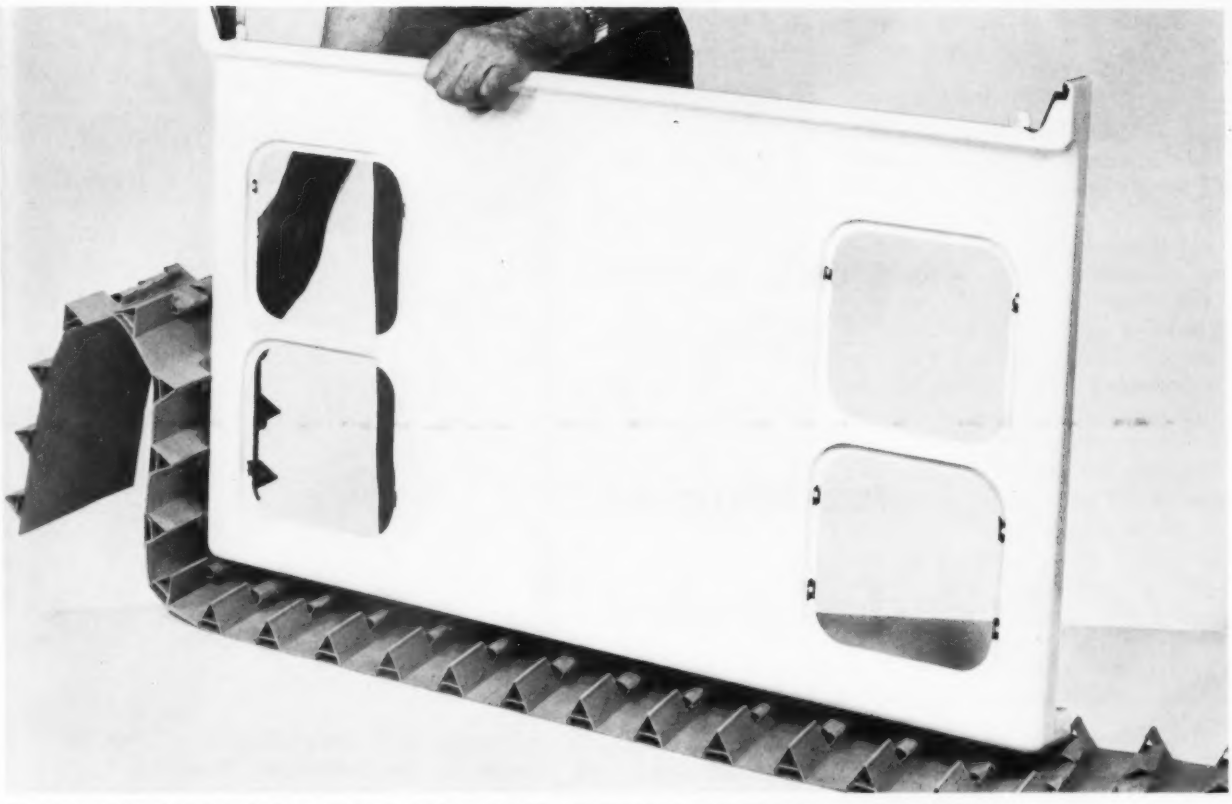
Six types of packaging material

"We use six different types of packaging materials in the parts shipment section," Reynolds points out as an example of the thoroughness of this packaging program. "Necessarily, since we constantly change contents, we can't get approval of the packaging in line with the National Safe Transit Program — as does our regular production line — but I can assure you that just as much care goes into our packaging. And our results — reduced intransit damages — have been outstanding.

"You might be interested in knowing that we are now installing an IBM machine to provide accurate and immediate tabulations of repair parts flow," Reynolds points out, "another customer service that the customer never sees but it assures no 'Out of parts — will ship later' notices from this office."

to Page 76 →

***Packaging Larger Items** is being done in the photo above with tops and panels being slipped into place in the cardboard containers. This particular packaging system has proven itself as an excellent means of parts protection in transit.*



FOR PACKAGING REPAIR AND REPLACEMENT PARTS

Roper Corp. Relies on SUS-RAP for Safe Transit

SAFE TRANSIT of replacement and repair parts is of prime importance to the Geo. D. Roper Corp. of Rockford, Ill., manufacturer of Roper gas ranges and gas driers. "And that means proper packaging," asserts Tom Reynolds, manager of Roper's Customer Service Department. "We want, always, to be sure that our parts arrive at their destination ready for immediate use by the customer."

SUS-RAP HAS PROVIDED THAT ASSURANCE. Besides minimizing the need for auxiliary packaging components—thus reducing packaging costs—SUS-RAP's engineered-in protection has helped in Reducing Roper's in-transit damages to an absolute minimum.

SUS-RAP

Why not let SUS-RAP packaging engineers help you with your packaging problems? Let them show you how SUS-RAP's vertical and horizontal suspension will safeguard your products, too — in and out of the carton. And do it without pad folding and with fewer packaging components. If you're watching costs—and want *Safe Transit*—write us today.

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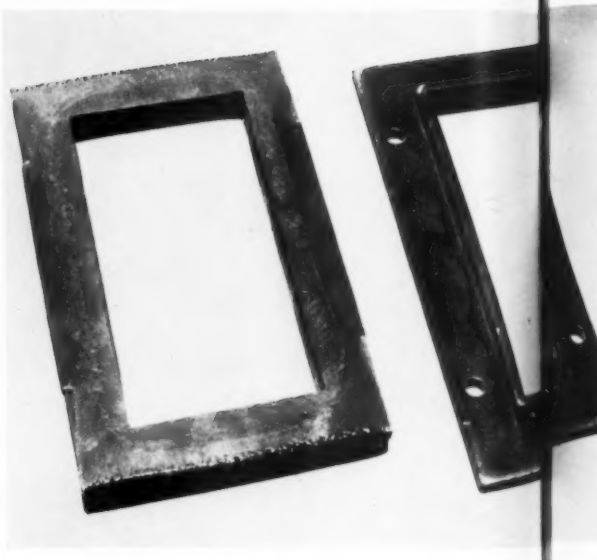
Lessons you can learn from the Higgins Redesign Award



PMI's annual John Woodman Higgins redesign and award contest has gained much attention in its short life. Its value as an incentive toward industry-wide improvements makes it an outstandingly valuable educational force.

by Carter C. Higgins,

PRESIDENT AND GENERAL MANAGER, WORCESTER PRESSED STEEL COMPANY, WORCESTER, MASSACHUSETTS

YEARS AGO, Henry Ford made the statement that the problems of production start back on the drawing board. That statement could well have read: "*The problems and the achievements* of production start back on the drawing board." The first question is "What shall we make?"; the second is "How shall we make it?". The answers to both questions are the province of the design engineer.

The efficiency of any design must be considered from many viewpoints: the material required, processing and production techniques, material and production costs, compatability and interchangeability, performance, maintenance and repair. The best time to avoid such problems, however, is in the initial design stage; they should be anticipated and prevented, rather than solved and overcome after they appear. Nor should your designer be limited to designing around your production equipment; this can prove expensive.

Reasons for changing designs

Nevertheless, design changes during production continue to be made. Improvements in quality and efficiency, reduction in costs, simplification of production, changes in styles, stimulation of a lagging market are some of the more basic reasons. Such changes may be for the purpose of reducing costs by using a less expensive material or an even more expensive material which can be processed or fabricated at a much lower cost.

Reducing cost a factor

Again, the reason may be a desire to simplify the manufacture of the product and thus lower production costs. Or, it may become necessary to improve an inefficient or otherwise unsatisfactory part; or it may be necessitated by a design change or improvement made on a component or another part.

A slight design change may bring about decided savings, and both individual firms and trade associations in the manufacturing industries have been attempting to stimulate the interest of the engineering profession in more efficient and economical redesign.

About the redesign award

One recent effort in this direction is the sponsorship of the annual John Woodman Higgins Redesign Award by the Pressed Metal Institute, whose headquarters are in Cleveland, Ohio. Donated by the Worcester Pressed Steel Co., Worcester, Mass., in honor of its founder, the Higgins Award was established on the occasion of the company's 50th anniversary to stimulate original and outstanding redesign in the multi-billion dollar stamping industry.

It is based on three criteria: sucessful metal stamping production of a part previously manufactured by another process, originality of design and significant production cost savings as compared to other processes previously used.

The 1956 John Woodman Higgins Redesign Award winner was Francis B.

The author: *Carter C. Higgins*

Lord won the coveted honor for redesigning a wave guide flange for TR radar tubes used for low-frequency scanning. The part originally was made from a piece of steel machined all over. In another attempt, the flange was made from a dropped forge blank, machined and broached.

The Waltham manufacturer first tried unsuccessfully to draw the part from a flat strip. Then, he conceived the idea of having it coined in heavy presses.

All but the heaviest stamping work is done in the Lord shops. No machining is required except that the back is ground to provide a flat surface. Tolerances of .005 are held with high surface finish.

1955 winners and entry

Last year's winners, J. B. Horvay and D. A. Solley, design engineers at the General Electric Company's Major Appliance Division at Louisville, Ky., submitted a redesign of an integral liner backplate and drain trough for G-E's electric combination refrigerator-freezer. The redesign substituted a pressed aluminum trough for a plastic trough which required a heating element.

This carefully engineered changeover to stamping resulted in the appliance's capability to receive and dispose of defrost water of lower temperatures, causing a significant reduction in the size and operating temperature of the evaporator without any reduction in refrigeration efficiency. It also effected a production saving of 23% or $40,000 annually, not taking into consideration the saving to the customer in electric power consumption, evidenced by lower electric bills.

Others honored for service

Honorable Mention went to L. J. Kroha of the Fitzsimmons Mfg. Co. of Detroit, Mich., for the redesign of five automotive parts: four transmission parts for 1955 Pontiacs and Oldsmobiles and a Chrysler engine thermostat part, resulting in savings of $500,000 annually in production costs. J. A. Grainger of Rolls Royce, Ltd. of Derby, England, also received Honorable Mention for his redesign of cast aluminum brackets to steel stampings with welded attachments, effecting annual savings of 58%.

The entries in the Higgins Redesign Award competition confirmed the fact that making the properly shaped component in the proper way can result in substantial production dividends. It must be admitted that there is a "knack" to designing for economical stamping production; a knack which, unfortunately, is not adequately taught in even the best technical institutes and engineering schools.

Pressed Metal Institute purpose

The Pressed Metal Institute is seeking to disseminate technical information on stamping design and production techniques throughout the manufacturing industries, particularly to design engineers and technical educational institutions.

In addition, member companies are anxious to supply advice and technical assistance in design problems. Their

1956 winner: *Francis Lord*

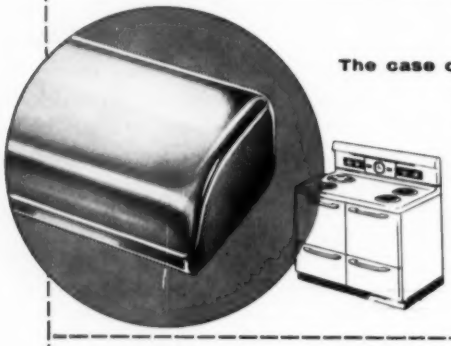
Lord, owner of the Lord Machine Co., Waltham, Massachusetts, manufacturers of electronic components, Lord's redesign may save as much as $74,000 a year for his customers.

1955 Winners *were GE design engineers, D. A. Solley and J. B. Horvay. Here Horvay is shown accepting the award at PMI presentation ceremonies.*

Actual case histories of unusual design problems solved by Pyramid Mouldings

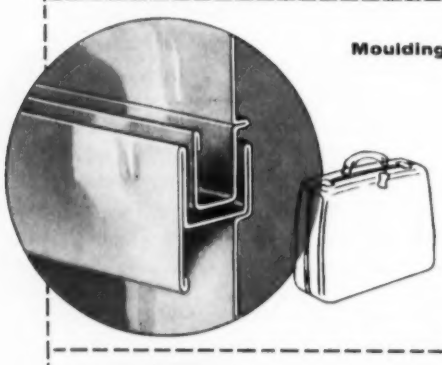
Pyramid Mouldings

Design Clinic



The case of the range lamp...

following the trend to longer lines has been ideally answered with rolled mouldings. Made to any desired length without change in tooling, ends are often formed as shown to eliminate costly end caps.



Mouldings made "case" history...

in one of America's leading luggage lines by adding the finishing touch to smart styling with these intricately formed bezels. Rolled to shape and bent to exact case contour, they covered raw edges, added structural strength, provided dustproof construction.

The case of the missing "drop-out"...

has meant money to the many manufacturers who have found that mouldings rolled in spirals and cut in circles eliminates waste unavoidable with stamped parts. Bezels, burner rings or *any* ring or bezel can be economically roll formed by Pyramid.

Write today for your free "Plan Book of Metal Mouldings"

Pyramid Mouldings Inc.

5365 WEST ARMSTRONG AVE., CHICAGO 30, ILL.

NEW YORK... CALIFORNIA

HIGGINS CONTINUED

engineers naturally think of inexpensive strip and sheet materials being formed in fast-acting presses between male and female die members. They analyze design problems with this in mind, competing with each other to arrive at the best part at the least cost. If quantities run to 50,000 lots or more, they visualize progressive operations.

Difficulties in metal stamping

Needless to say, the metal stamping industry recognizes that there are some inherent limitations to the stamping process. Many such designs require expensive tools, although short-run specialists are making striking progress. Multiple thicknesses are hard to obtain. Blanked and pierced or trimmed edges are not as smooth as a machined edge; and they carry burrs, though shaving helps. Annealed, deep-drawn parts require polishing before bright finishes are applied. Sheet metal will dent, rather than fracture, under impact.

It pays to study and know these limitations, and those applicable to other fabricating processes. Any efficient and reputable supplier should be able to point them out if you will discuss your problems frankly with him. Yet, the high press speeds, uniformity, inexpensive materials, lightness and lack of porosity, close tolerances and attainable finishes make it worth-while to design around stamping limitations for profitable production.

Developments are constant

New shapes are constantly being stamped or drawn. The stamping manufacturer has to be familiar with coining processes, close tolerance work, ironing, cold extrusion, impact extrusion and other methods of obtaining thickness variation from raw material of uniform thickness. This, incidentally, is a convincing and substantial argument against the practice of relying solely upon "captive" stamping talent.

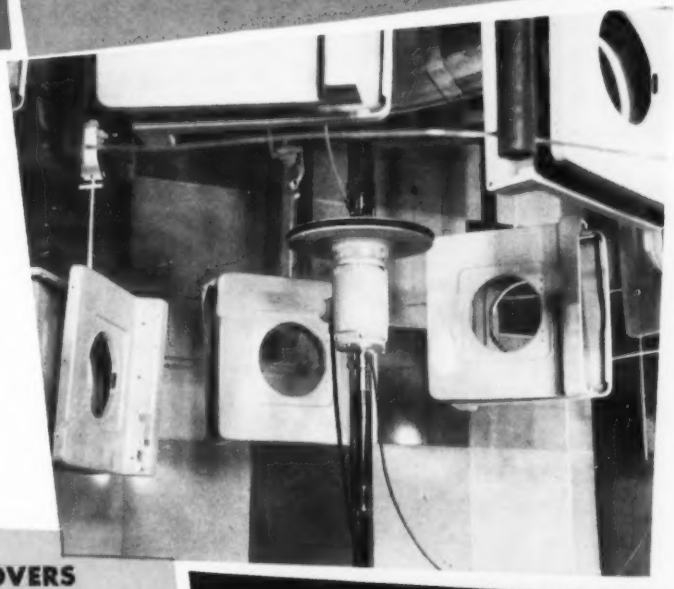
The design engineer should approach his needs with an open mind as to the process to be used. At some phase in his thinking, he begins to design for economy by particular fabricating processes. Not all redesigns result in the very large savings indicated by Mr. Kroha of Fitzsimmons. His redesigns look simple — the sort of redesign any smart stamping man could come up

NOW

for the first time...

PORCELAIN ENAMEL

is being applied successfully—
Yes, even spectacularly—
with RANSBURG NO. 2 ELECTROSTATIC SPRAY PROCESS



General Electric—an extensive user of Ransburg Electro-Spray for painting with synthetic enamels—is the first to use Ransburg No. 2 Process in the application of porcelain enamel.

GE—less than a year in electrostatic production—now is processing almost a million square feet of cover coat each month in the General Electric Home Laundry finishing department at Appliance Park.

DRYER TOPS AND WASHER COVERS ARE BEING COATED ELECTROSTATICALLY WITH THESE SPECTACULAR RESULTS

Quality of appearance and chip resistance are greatly improved with all colors: white, yellow, pink, turquoise, blue and brown.

About 97% of the atomized enamel is deposited on the washer and dryer parts.

Because of improved uniformity in coating thickness, weight of applied enamel was substantially reduced.

Because of lower application weight, the few rejected parts can be re-processed more times before being scrapped. This reduces the ultimate scrap rate by at least 95% of that previously expected.

Efficiency, measured by the amount of good ware, averages above 90%.

Want your products tested?

Ransburg has fully equipped laboratory facilities including reciprocating disks, helical conveyors, stationary disks, and the latest advancements in equipment for applying porcelain enamel with the No. 2 Electrostatic Spray Process. Manufacturers are invited to send sample products to our Indianapolis laboratories for tests and demonstrations to prove for you the advantages and benefits of electrostatic spray application of porcelain enamels.

Ransburg **ELECTRO-COATING CORP.**

Indianapolis 7, Indiana

RANSBURG

HIGGINS CONTINUED

with after a walk through your plant. More power to him that he went ahead.

One wonders, in such instances, why forgings and castings were ever used; but who can doubt that such opportunities for dividends are waiting for discovery in many manufacturing companies?

A "home grown example"

My own firm, for instance, recently redesigned a die-cast gasoline tank for a power saw that resulted in striking savings; and one wonders, again, why the die cast process was chosen. On other occasions, our redesigns were not successfully competitive, but the customer did not lose anything by the investigation.

Can we eliminate "redesign"?

Although the Pressed Metal Institute has established a "redesign" award, it must be reiterated that such difficulties should be anticipated and avoided in the original design stage. Who likes to throw away the tooling for a job designed wrong? Redesign takes time. The designer needs all pertinent information on assembly, conditions of use and projected quantities. Changes made after the part goes into production are costly. In making any such change the urgency should be carefully considered. If the need for the change is urgent, and it must be put into effect at the earliest possible moment, it must be expected that costs will mount.

Value of product design

The design of any product is the first and basic step in establishing manufacturing costs as well as the real service value of the product. If the design is poor or requires change, more time will be taken in processing, more labor, supervision and inspection will be required, greater spoilage, and user dissatisfaction and resultant loss in reputation and prestige.

A well-designed product lends itself to economic production and gives real value in service. To solve the problems of production, therefore, one must "go back to the drawing board" and give the fullest possible consideration to every part of the design and to whether each part should be stamped.

If your designer is not an expert on stampings, I recommend he call reputable stampers in to help him. Obviously, the Higgins Redesign Award only scratches the surface. If as low a figure as 15% of your parts now fabricated in other ways, can be redesigned as simpler stampings, I suspect that across the country at least a half billion dollars could be saved.

ACS CHICAGO SECTION HOLDS LAST MEETING OF SEASON

A new manufacturing outlook and engineering design concept in tunnel kilns for the completely automatic firing of ceramic wares was embodied in the speech by William J. Meid for the April 6 meeting of the Chicago Section of the American Ceramic Society, Inc.

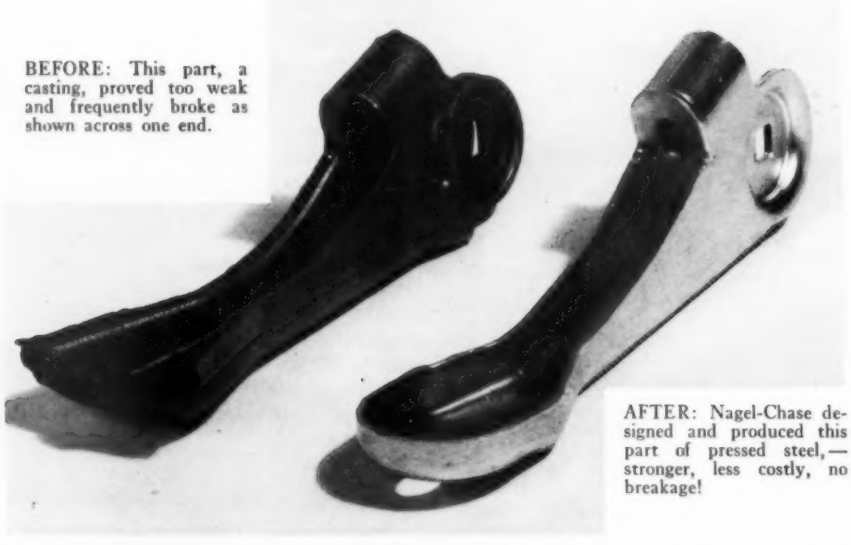
Also on the program was John F. Lynch's talk on "Controlled Protective Atmospheres for Firing Ceramic Products".

O'SULLIVAN RUBBER APPT.

The O'Sullivan Rubber Corp., Winchester, Va., has announced the appointment of T. T. Lewandowski as assistant sales manager of the Plastics Div.

A SUGGESTION TO DESIGN ENGINEERS:

Sometimes it's better and cheaper in pressed steel!



BEFORE: This part, a casting, proved too weak and frequently broke as shown across one end.

AFTER: Nagel-Chase designed and produced this part of pressed steel,—stronger, less costly, no breakage!

When you, as design engineer, are faced with a problem of deciding the best, strongest and most economical way to make a certain part, it might pay you to consult Nagel-Chase. Experts for many years in the design and manufacture of pressed steel products, including many styles of Casters and V-Belt Pulleys used in the appliance industry, Nagel-Chase has frequently been able to produce a pressed steel design that was more satisfactory from both a performance and cost standpoint. The part illustrated is a typical example of how Nagel-Chase produced a part of pressed steel to replace a die casting that was breaking in operation. Consult Nagel-Chase for all your pressed steel needs, and for your caster and V-Belt requirements.

NAGEL-CHASE MANUFACTURING CO.

2811 N. Ashland Ave. Chicago, Illinois

MANUFACTURERS OF NAGEL-CHASE CASTERS AND V-BELT PULLEYS

D-ENAMELING

is more economical than ever . . .

Once D-Enameling was a temporary expedient which appliance manufacturers used to stretch critical steel supplies, but that day is gone! Now, America's leading appliance manufacturers consider D-Enameling a permanent part of their manufacturing picture. D-Enameling has come of age . . . has assumed its role as a routine step in appliance manufacturing. The reason is simple — D-Enameling transforms scrap loss into profit dollars.

THESE INDUSTRY LEADERS KNOW FROM EXPERIENCE THAT D-ENAMELING TRANSFORMS SCRAP LOSS INTO PROFIT DOLLARS

AIRLINES

HOME LAUNDRY APPLIANCE MANUFACTURERS

JOB ENAMELING PLANTS

RANGE MANUFACTURERS

REFRIGERATOR MANUFACTURERS

SANITARY WARE MANUFACTURERS

SIGN MANUFACTURERS

SPACE HEATER MANUFACTURERS

WATER HEATER MANUFACTURERS

**D-Enameling is a patented process.*

New Process *D-Enameling* Corp.

Highland and New Haven Avenues • Aurora, Illinois

For functional parts and trim . . . pre-design planning with Nickeloid Metals pays off for sales-minded, cost conscious manufacturers.

THESE FINE PRODUCTS WERE DESIGNED *AROUND* NICKELOID METALS

In the pre-design stage . . . before investing in tools and dies . . . consider pre-plated Nickeloid Metals. Take full advantage of their inspiring design potential and basic production savings, too. PRE-plated in uniform, quality-controlled finishes of chrome, nickel, copper or brass on base metals of steel, zinc, copper, brass and aluminum — Nickeloid Metals require no cleaning, plating, polishing. Just fabricate the parts and assemble. Eliminate 3 out of 5 basic manufacturing steps; save time, reduce costs, increase output.

MAR-NOT PROTECTION

To protect the brilliantly finished surface during drawing and forming operations, and in handling, Nickeloid Metals are available with MAR-NOT — a protective covering that affords absolute protection until final assembly, then may be peeled off. **Write for full details.**

Get the design-inspiring, cost-saving facts first hand at BOOTH 418 - DESIGN ENGINEERING SHOW Philadelphia Convention Hall -- May 14-17

NICKELOID METALS SINCE 1898

AMERICAN NICKELOID CO.

PERU 11, ILLINOIS

ARCHITECTURAL CONTINUED

→ *from Page 39*

Posey's presentations as reported in *finish*, this speaker favors the use of modern materials that are capable of proving themselves useful to meet our

RICHARD E. PARET

present day requirements. Posey pointed out that shop assembly today is being carried out as far as fabrication techniques will permit. This, of course, may not be the ultimate. "Our new style of architecture," stated Posey, "is gleaming rather than dull." This refers to the three major types of metal curtain walls — stainless, porcelain enameled steel (or porcelainized as Mr. Posey calls it) and aluminum. The speaker referred to sheet steel porcelainized as a happy wedding of glass and steel.

Richard E. Paret, secretary of the Committee of Stainless Steel Producers, American Iron and Steel Institute — talked on "Stainless Steel — Helping Create the Future for Metal Walls."

The public relations job in selling metal walls for buildings is a program in which *all metal sources* must cooperate. The idea of metal walls must first be established, Paret asserted.

"Our competition," he said, "is not among ourselves but with other types of materials."

He dramatized the publicity value of buildings such as the Socony building in New York City. "Collectively," he said, "we can carry on a big program. Work for 'metal walls', regardless of whether they are aluminum, porcelain enamel or stainless steel."

"Aluminum in the Curtain Wall Industry," was discussed by Alcoa's Fritz Close.

Close opened his talk with a question: "Where will we be twenty years from

to Page ST-9 →

McDANEL

MILL LININGS AND GRINDING BALLS

These 8 ft. ball mills are ready for shipment by the manufacturer. They are completely lined with McDanel Super High Density Brick and equipped with McDanel Mill Head Assemblies for long life and satisfaction.

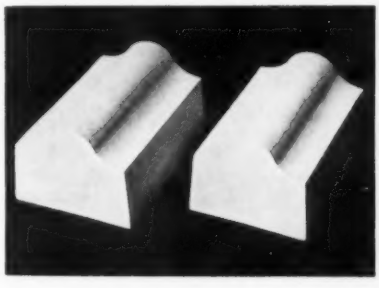
An Unbeatable Combination That Gives You More Production At Less Cost!

• This ball mill is being lined with McDanel Super High Density Brick. Notice the smooth surface and the broken joint installation—a time-proven method used by brick masons for centuries for greatest strength and durability. We've made and tested it for years. Customer satisfaction and repeat orders tell us that it's saving users time and money. McDanel Super High Density Brick is harder, stronger, more uniform and longer lasting. 1-1/2″, 2″, or 2-1/2″ thicknesses available. Better check on McDanel Super High Density Brick today!

• McDanel Ceramic Grinding Balls are known in many fields for their long wear, extreme purity, superior impact resistance and uniform grinding quality. Made from a scientifically developed body with constant control during manufacture and rigid inspection. Any pick-up due to wear is uniform and compatible for most products. Investigate them today!

McDANEL SUPER HIGH DENSITY LIFTER BARS

Made of the same strong, long-wearing body as the high density brick. Aid in cascading ball charge for more efficient and faster grinding. Long-lasting. Specially designed and tested for proper contour.



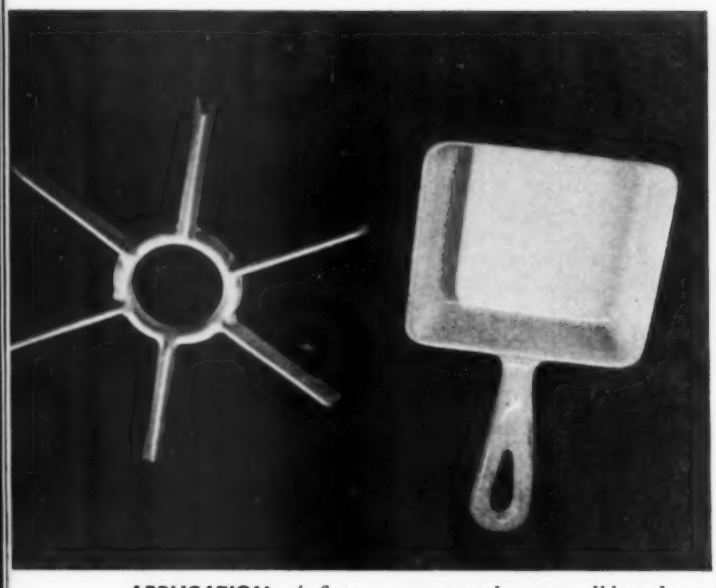
McDANEL *Industrial* CERAMICS

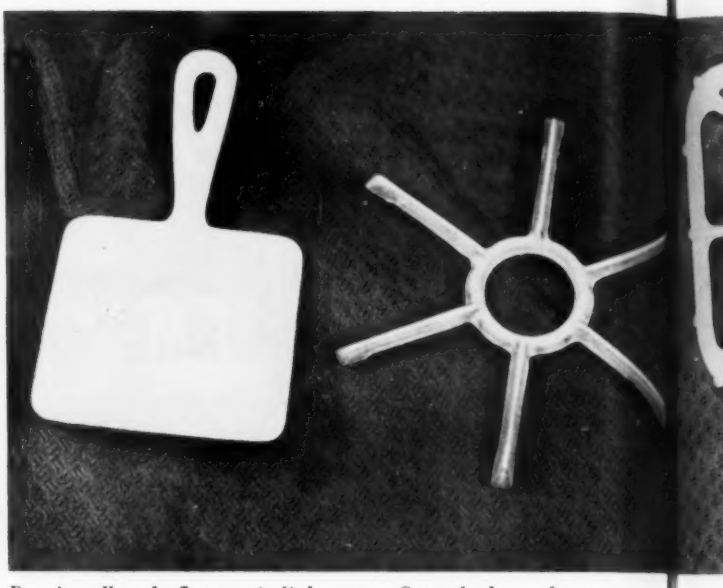
McDANEL

REFRACTORY PORCELAIN COMPANY

BEAVER FALLS • PENNSYLVANIA

Send for information on McDanel High Density Mill Linings and Grinding Balls. Ask for Bulletin B1-55. Do it today!



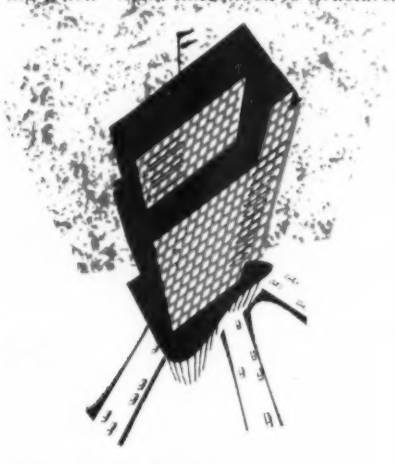


APPLICATION *of fluorescent enamels to sandblasted cast iron examples caused this appearance under black light. Pan is yellow buff, gray is light gray. Second photo shows items as they appear under natural light.*

Luminescent porcelain enamel--a new look in permanent finishes

eight colors now available that react under black light in such fashion as to open up a new realm of possibilities for P.E. usage.

STARKLY DRAMATIC *skylines could well be result of development, with sky scrapers, one color in the daylight, changing over to a splash of luminescing color, under black light excitation, lending a new "night time" look to structure.*



by D. C. Bowman • SENIOR CERAMIC ENGINEER, CHICAGO VITREOUS CORPORATION

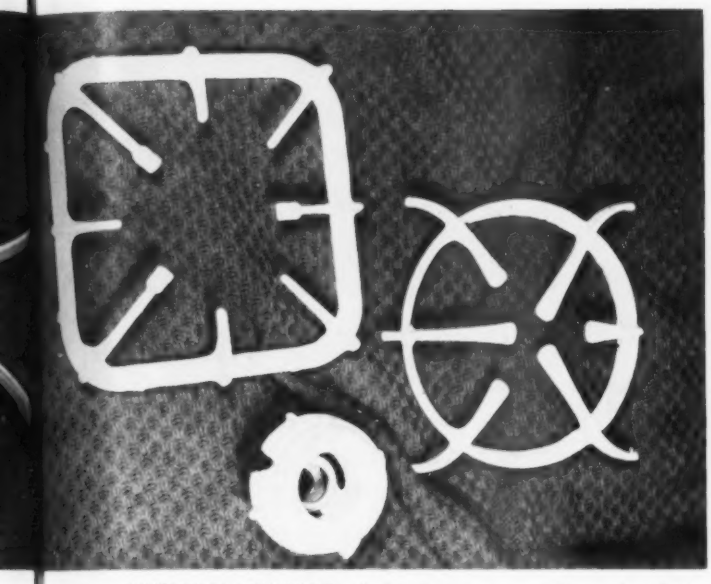
Exclusive feature finish

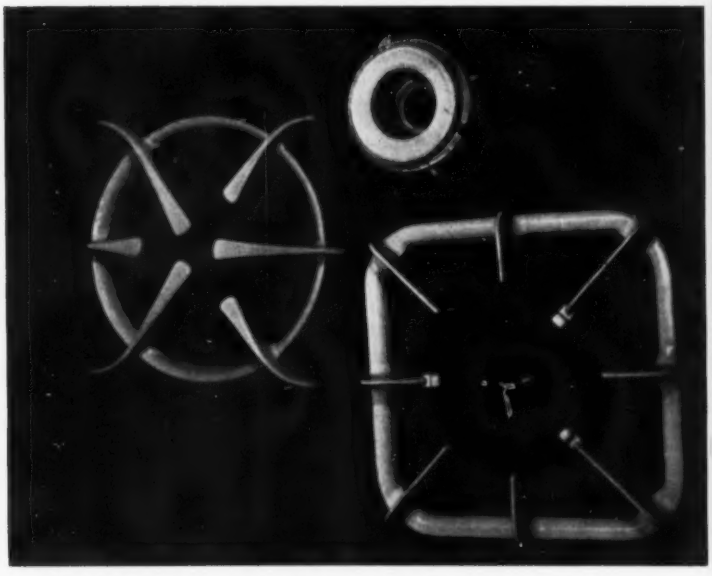
LUMINESCENT PORCELAIN ENAMELS that glow brilliantly and perhaps weirdly in the dark under the excitation of ultraviolet "black light" can now be applied and fired with ordinary enameling equipment. Presently being supplied to the enameling industry in milled form with general instructions for processing and milling, eight colors and variations are available. The finished panel, part — or what have you — when processed in the regular manner, will appear either off-white, cream or ivory under incandescent or ordinary day light. But come darkness, with the application of "black light" magic, brilliant, sparkling oranges, chartreuse, light greens and blues, blue whites, deep greens, blue greens or bright specked blues pop up out of the darkness for vivid effect.

Both instant fade and afterglow effects

While more colors will assuredly appear, attempts so far have not resulted in any strong true yellows or reds. Some of the luminescent enamels show decided afterglow or phosphoresence, while others are fluorescent and fade either rapidly or instantaneously when removed from the "black light" excitation.

"Near" ultraviolet or "black light" of 3660 angstrom units in wave length now widely used in the advertising field is utilized to bring out the colors. Most dramatic effects can be gained by employing black light continuously in conjunction with incandescent lights func-





ANOTHER EXAMPLE *of development, as shown in photos on facing page. The round grate was given a bright yellow-orange fluorescent enamel, the square grate a tan-gray and the burner, a tan-gray. Left photo is natural light shot.*

tioning intermittently. Inasmuch as ordinary porcelain enamels, regardless of color, do not fluoresce or glow under ultraviolet light but show as velvet black, many startling contrasts are possible.

How wide the possible use of these "new colors" is left only to the imagination. The possibility of having the porcelain enamel skyscraper of tomorrow give off multi-color effects against the night sky ranges well within the realm of possibility.

Applications are limitless

But for the present the possibilities for using luminescent porcelain enamels as conventional background or for letters or borders on outdoor advertising and informational display signs require only the advertising and sign manufacturing trades' indulgence to give it adequate exploitation.

Possible combinations now available could be such as bright red porcelain enamel letterings (under white light) turning to deep black when the "black light" takes over and the white light extinguished.

This type of sign can be manufactured in two ways: either to fade rapidly or instantaneously and (activated by practically any type of visible light containing some ultra violet) to continue to afterglow for short periods in the dark.

Only those colors listed earlier are now being offered. Also, a preliminary study has now been completed of the black light fixtures and the various types of filters now on the market. The results are available to those manufacturers seeking more complete information on the subject.

Application of luminescent

Luminescent porcelain enamels are most effective when applied by spraying at weights of 30 to 45 grams per sq. ft. dry over fired light coats of zircon white cover coats and colored or clean glasses free of antimony or lead. The luminescent enamels can also be applied over fired ground coat, but these tend to display less fluorescent intensity than achieved by applications over cover coat enamels.

Should titanium opacified enamels be used as a base for the luminescent enamels, the titanium enamel may display rather serious texture defects where the piece is not covered by the luminescent enamel. This is true if the fluorescent materials contain sulfides, and the titanium enamel is not of the "sulfate pitting" resistant type. However, there are sulfate pit resistant titanium enamels available which work out very well with fluorescent enamels.

Application of the coats is done in the conventional manner.

Firing luminescent enamels

Luminescent porcelain enamels which fire in the 1400, 1460-80, 1500 and 1520° F. temperature ranges from 2½ minutes, on 18 gauge steel are available. No special furnace atmosphere is required. The normal oxidation atmosphere appears entirely satisfactory.

Indications are that the luminescent enamels will withstand 4 or five firings. Maximum luminescence seems more probable with the least possible number of fires, however. The greatest relative fluorescent brilliance is obtained with those luminescent enamels designed to fire at 1400°F., but this particular luminescent enamel is suitable only for indoor exposure.

Durability — weather resistance

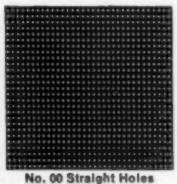
Panels made up in the colors listed earlier have withstood the effects of a 1000 hour weatherometer test understood to be the equivalent of 23,000 hours or nearly 3 years of outdoor exposure.

Some leachings and streaking were observed in daylight on several of the non-acid resisting luminescent samples, but application of a light acid resisting clear glaze on the same enamels was found to completely prevent such deterioration. Very little change could be noted in the fluorescent colors of the tested non-clad resisting samples under black light. No daylight or black light difference or change in gloss was noted for those identically tested samples which had received an acid resisting coating.

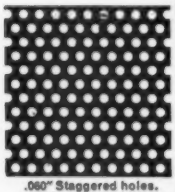
After the weatherometer tests samples were covered with a salt scum from

Perforated Materials for *Every* Application

Contact H & K for any perforated materials your product may require.

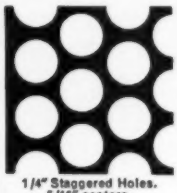


No. 00 Straight Holes
952 holes per sq. in.
.020" diam. 30% open.



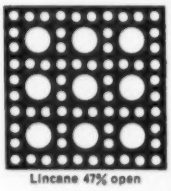
.060" Staggered holes.
126 holes per sq. in.
3/32" centers. 38% open.

We have tools for perforating thousands of different patterns.



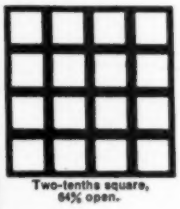
1/4" Staggered Holes.
5/16" centers.
.25" diam. 58% open.

We will be glad to work with you on your perforating problems.



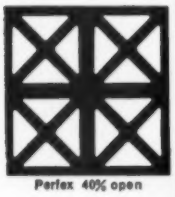
Lincane 47% open

See our catalog in Sweet's Product Design File.



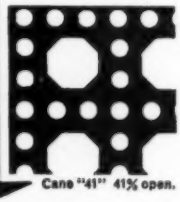
Two-tenths square,
64% open.

Perforating all metals, Masonite, plywood, paper, cloth and plastic.



Perlex 40% open

Round holes, square holes, slots, ornamental patterns, oblong holes, oval holes.



Cane "41" 41% open.

Fill-in and mail coupon to office and warehouse nearest you.

THE **Harrington & King** PERFORATING CO.

Chicago Office and Warehouse
5640 Fillmore Street
Chicago 44, Ill.

New York Office and Warehouse
116 Liberty Street
New York, N. Y.

Please send me—

- ☐ GENERAL CATALOG NO. 62
- ☐ STOCK LIST of Perforated Steel Sheets
- ☐ SAMPLES of Perforated Plastics and Paper
- ☐ PRICE INFORMATION (NOTE: Send specifications of perforated materials wanted. If necessary send drawings or sketches.)

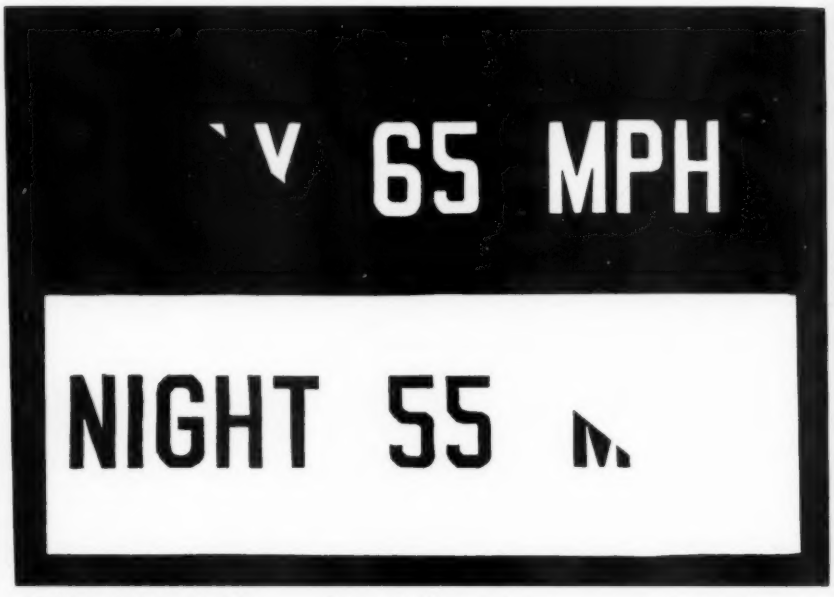
NAME_____

TITLE_____

COMPANY_____

STREET_____

CITY_____ ZONE_____ STATE_____



***DOUBLE LEGEND SIGN**—possible with the new development is illustrated in the combined photos above which show sign under normal light—top right—and under black light—bottom. Top portion was light blue fluorescent enamel brushed to white letters which are non-fluorescent white coat enamel and appear black under black light. Bottom was white appearing fluorescent enamel brushed to white letters—invisible in the daylight, but appearing sharp and clear as the top legend disappears under the influence of black light beams.*

LUMINESCENT CONTINUED

the water spray used in the test cycle. This was easily removed with a damp cloth and a mildly abrasive porcelain enamel cleaner.

Examination of the test samples in daylight and under 3660 A.U. black light revealed that weatherability was excellent, save for some leaching of the non-acid resisting samples. This is to be expected with this type of enamel.

Indications are that samples which received the acid resisting coating could continue unchanged over even longer test periods.

Possible applications of the luminescent panels at the present time include the conventional type of advertising: billboards, store signs, spectaculars, bar, restaurant and theater murals, etc. Safety or informational type signs also provide a good field for usage: exit, entrance, warning signs, office directional signals, electric switch plates, etc. Gas station panels or store fronts would provide top attention for the owners. Military use of the luminescent enamel for blackout condition identification and naval usage, because of the salt spray resistance characteristics, are entirely feasible. The possible applications could go on and on. These are only area explorations to serve as a starter.

Contamination of luminescent porcelain enamels with materials containing cobalt, lead, titanium oxide, iron and arsenic tends to kill the glow either partially or entirely. Tearing or handling marks and scars in the luminescent enamels show up readily when the enamel is fired and exposed to black light, as the scarred portions do not fluoresce. Iron or ground coated plate scraped on luminescent porcelain enamels show as black lines under ultraviolet light, because material scraped off the iron or ground coat edges will not fluoresce. Moreover, it is extremely difficult to get rid of these non-fluorescent lines. An acid resisting glaze over the luminescent porcelain enamel does away with this problem, as the iron does not appreciably mark the acid resisting glaze.

No definite figures can yet be given on the duration of afterglow or phosphorescence in those porcelain enamels which display this characteristic. It is believed, however, to be of relatively short duration and dependent upon numerous factors, such as firing, excitation, etc. Afterglow which was seen in total darkness for 30 minutes by the acclimated human eye has been reported.

BROWN another PERMA-VIEW user

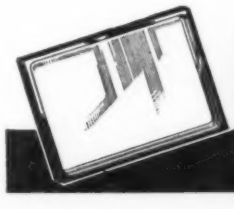
This 1956 model range manufactured by Brown Stove Works, Inc., Cleveland, Tennessee incorporates the Mills' PERMA-VIEW window.

Brown Stove Works, Inc., Cleveland, Tennessee, is one of the 46 leading range manufacturers now using PERMA-VIEW windows.

Forward thinking executives at Brown recognize the fact that home makers have come to expect "visible cooking" when they buy a new range. PERMA-VIEW, "the window you can see through always", is the logical answer to this demand.

The PERMA-VIEW window is pre-engineered and comes to you ready for immediate installation in your range. "Out of our carton into your door." Let our specialized production lines serve as a part of your sub-assembly facilities. Phone us at MArket 4-1591 and we will give you complete details on the ease and economy of adding this sales feature to your new ranges.

"out of our carton — into your door"



MILLS PRODUCTS INCORPORATED

1015 WEST MAPLE ROAD • WALLED LAKE, MICHIGAN

***Not unusual** is for Roper Representatives to make their presence known in customers' homes where they aid the local service men in making installations. Here Roper Representative John Ritchie points out methods for calibration and oven control adjustment procedures to a dealer's service man.*

ROPER SERVICE **CONTINUED**

Roper management is fully aware of the importance of the printed word to insure fuller understanding of its products. Brochures prepared by the Service Dept. include the 36-page Roper Installation manual — a booklet crammed with simple-to-understand but accurate diagrams of every component — and the component's parts — as well as installation diagrams of the integrated systems. This, plus a parts list — showing all the separate parts, where they are in the range, and how to order them — is placed in each range before it is shipped, along with a brochure from the Advertising Dept. on *"Care and Operation."*

The printed word as service-sales aid

Additional service literature includes *The Roper Ranger*, a company house organ aimed primarily at the sales personnel, although some service personnel also receive it. Included in the *Ranger* is a monthly column, "Service Slants," written to provide immediate notice of particular problems that have cropped up, evidenced by field reports, or to give full explanations of some engineering developments, for instance.

The Service Reporter — a bulletin-type release — is also published periodically to detail out pertinent information of interest in product servicing. This is sent to a group of some 5,000 service personnel. This *Reporter* and the monthly Reynolds' bylined column gives the Service Dept. immediate voice to the entire field to broadcast the latest in developments or methods.

Handling dealer complaints

What happens to every Roper dealer complaint that Roper receives? Well, everyone from the Service Manager to Company President Stanley Hobson sees it. And a double check set-up is made by which management is kept informed of the action taken on the complaint as well as the promptness of reply. This system provides for a thorough check of speed but, more importantly, keeps Roper management aware — up-to-date — on the reception of their product in the field and the problems that are facing their sales as well as service personnel.

Handling "letter-to-president"

Then there is the "retail customer" letter-to-the-president type complaint of which we are all familiar. This is handled directly by Roper President S. H. (Stan) Hobson. All of these letters are fully answered by the president himself if possible with a carbon of the presidential action going to the service manager for his records. Those complaints which cannot be handled by the president's reply are steered through the service department to the proper division manager. In such a case, a field representative promptly calls on the customer, reporting the result back to President Hobson.

Wrap up on the operation is the final letter from the president, assuring the customer of Roper's readiness to be of any future service, and stating the hope that everything has been handled to the customer's satisfaction.

Roper's built-in "feed back"

Brochures, service personnel training, repair and replacement parts, customer complaints are all part of the Service Dept. personnel's job. But they have one other that might well be the most important of them all.

That job is assimilating and correlating all of the results — the activities — reported into the Service office, be it product breakdown, customer's comment, or servicemen's complaints. All of this material is tabulated, analysed and boiled down into a comprehensive book which Roper calls their *"Engineering Guide."* This booklet — which sometimes grows to quite large proportions — is studied avidly as it circulates through management, engineering, sales, advertising, and the Service Dept. as well.

"Results of today's customer service — and consumer reaction — may well become part of tomorrow's product," Reynolds asserts. "And this *Engineering Guide*, which we call the final statistical report, gives every facet of our operation an opportunity to see customer reaction as well as gain an understanding of the Roper marketing and service picture."

Suggestions from field

The nicest compliment we are paid is when our customer servicemen pass on their suggestions for product improvement and service. We look at every complaint as a greater opportunity to serve and sell. There is a *togetherness among us* that is real.

"And that," concludes Carl Sorby, "is a good picture of our Customer Service program. We're proud to show it to you. As you can see, we are pretty service minded. And we're proud you people at *finish* are publishing our story for our industry to read and, if they can, pick up some ideas that will improve their own position. We're for that. You see, we're not only customer minded, we're 'industry minded' as well."

COLOR IN FREEZER SHELVES and EVAPORATORS OF STEEL

▶ Thanks to recent Houdaille developments, *steel* freezer shelves and evaporators can now be produced in almost any modern color. Electro zinc plating, plus two electrostatically deteared and baked coats of a new DuPont Epoxy, result in a wonderfully smooth finish . . . so hard and so chip and scratch-proof it's practically indestructable. It has passed tests for breakdown and corrosion many times more severe than those specified for acceptable commercial standards. It's supremely chemical and acid-resistant.

With Houdaille's new processing facilities, it's an economical finish, too. That means you can now feature the strength of steel . . . and the numerous other advantages and interior cleanliness of Houdaille's copper-brazed, tube on plate or plate on plate construction . . . without cost penalty. Our modern engineering, research and test facilities are at your service to help develop units to your specifications.

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NORTH CHICAGO DIVISION

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Manufacturers of: Evaporators, Cabinet Cooling Plates
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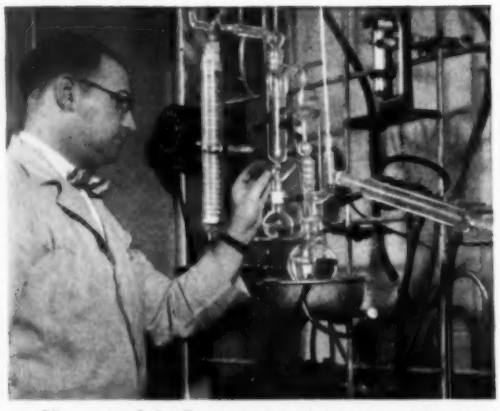
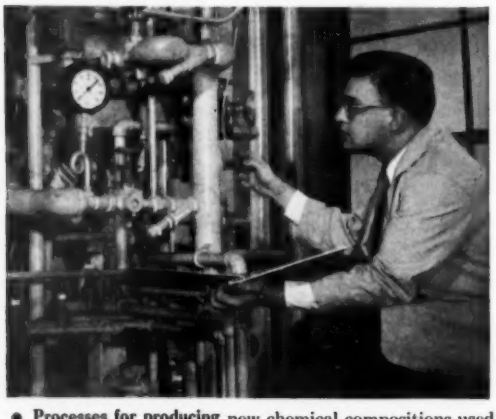
415 Finishes Technologists



• **Often one of the first steps** in solving a special coating problem is synthesis of a new compound or a new resin. Pittsburgh's modern Paint Research Center is equipped with the most modern facilities for such work.



• **Processes for producing** new chemical compositions used in making better surface coatings of all kinds are developed in a special pilot plant.

They'll help you develop better finishes for today's products . . . special finishes for tomorrow's goods—without adding to your payroll!

THE CONSTANT STREAM of new and improved products brings with it demands for finishes with more exacting requirements than ever before. Some of these can be solved with existing formulations. Others require completely new chemical compositions to provide new standards in adhesion, toughness and resistance to corrosion.

• **To help you get finishes** that meet your most critical specifications, Pittsburgh now offers you the most modern facilities for fundamental and applied research in the paint industry. In its new Paint Research Center at Springdale, Pa., and in the development laboratories of its 11 paint plants, Pittsburgh maintains a staff of 415 chemists, engineers and technicians. Here new materials, products, processes and application techniques combine in a program of progress to maintain Pittsburgh's traditional leadership in the field of surface coatings.

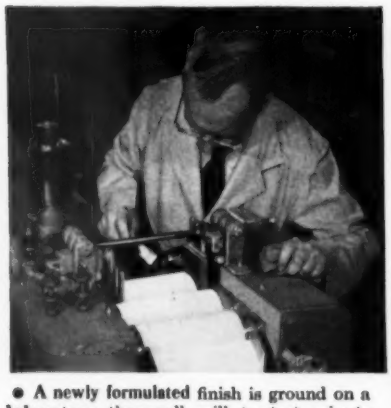
• **In addition** to discovering new and better products, these research facilities are available for the solution of any unusual finishing problems. Why not utilize this manpower and these facilities to get better finishes for your products—without adding to your payroll? Write, wire or call Pittsburgh Plate Glass Company, Industrial Finishes Division, 1 Gateway Center, Pittsburgh, Pa.

PITTSBURGH PAINTS

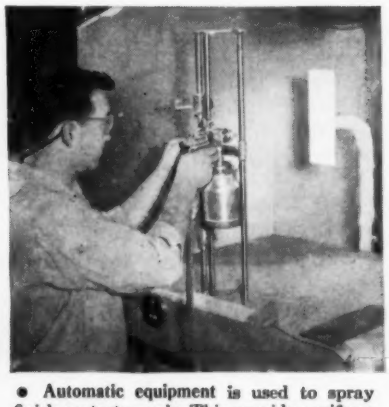
PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS • FIBER GLASS

PITTSBURGH PLATE GLASS COMPANY

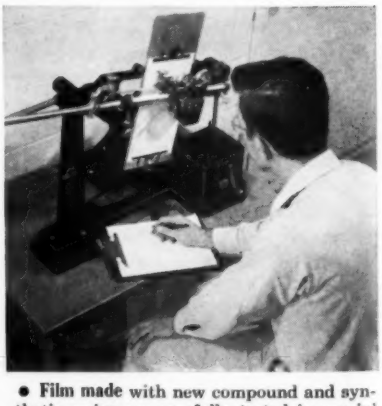
IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED



• **A newly formulated** finish is ground on a laboratory three-roll mill to test minute particle size and dispersion.



• **Automatic equipment** is used to spray finish on test panels. This provides uniform coverage of finish on these panels.



• **Film made** with new compound and synthetic resins are carefully tested in special equipment for tensile strength.

Some applications of colorimetry

two methods for measuring color objectively discussed, production color control methods reviewed, procedure for evaluating degree of color change is explained.

by R. M. Baker, • CANADIAN INDUSTRIES LTD., TORONTO, ONTARIO

COLORIMETRY is the science of measuring color, as the name implies. There are two distinct but similar methods of performing the measurement of color objectively, that is, without the color judgment of the human eye.

In the first, a spectrophotometer is used to measure the amount of light reflected from an opaque sample in each of several narrow wave-length bands across the visible spectrum, from wave-lengths of about 400 to 700 millimicrons. The amount of light reflected at each wave-length is measured as a percentage of that amount of light reflected by a specially prepared surface of magnesium oxide. If these per cent reflectances are plotted against their respective wave-lengths, the graph is called a spectrophotometric curve.

Numerical conversion of curve

A recording spectrophotometer draws such a curve automatically. Since it is inconvenient to work directly from these curves for the specification of colors or the determination of color differences, the curve is usually converted mathematically to a set of three numerical designations, X, Y and Z.

These three numbers are called the C.I.E., tri-stimulus values for the color. The initials C.I.E. are those of the French name for the International Commission on Illumination. The tri-stimulus values are a specification of color in themselves, but they are not fully satisfactory in the measurement of magnitudes of color difference. This deficiency will be discussed more fully later.

Operation of tricolorimeter

In the second method of reducing the visual sensation of color to objectively determined numerical values, a photo-electric tri-stimulus instrument, commonly called a tricolorimeter is used. The performance of such an instrument is similar to that of a spectrophotometer except that three percentage reflectances are measured through three wide-band glass filters instead of at each of several narrow wave-length bands across the visible spectrum. These three standardized glass filters appear to be green, red and blue, and the per cent reflectances of the light transmitted by them are appropriately symbolized by the letters, G, R and B.

The three numerical values obtained by either of these methods, that is, the tri-stimulus values or the three per cent reflectances, G, R and B, are all that is required in the way of experimental data for any one color sample in the types of colorimetry problems which will be considered here.

Sources for additional study

It is not within the scope of such a short paper on colorimetric applications to enter into discussion on the pros and cons of the various colorimetric methods or instruments. For those whose interest in colorimetry goes beyond this paper, the author recommends a book entitled, "Color in Business, Science and Industry" by Deane B. Judd of the National Bureau of Standards, Washington, D.C., and published by John Wylie & Sons. This book may be considered as the modern American "bible" in the science of colorimetry.

Interpreting color differences

Because it is so difficult to evaluate and interpret color differences, in terms that a person experienced in visual color comparison can readily understand, from the experimental data of a spectrophotometer or a tri-stimulus colorimeter, it is necessary to convert these data to the coordinates of some three-dimensional color coordinate system or color space.

For the interpretation of color differences, a pre-requisite of such a color space is that its color coordinates be equally visually spaced. That is, equal straight-line distances within the space should represent equal degrees of visual color difference. This property of a color space is called uniformity, a property lacking in the C.I.E. system.

Three coordinates of Adams system

From among the color coordinate systems that might be used, the modified Adams Chromatic Value System has been selected because, with the aid of tables now available, it is the best compromise between ease of calculation and colorimetric fidelity. It is an approximately uniform color space in that its color coordinates closely approach equal visual spacing.

The three coordinates that describe a color in the modified Adams System may be calculated with the aid of tables, either from the values obtained with the spectrophotometer, X, Y and Z, or those from the tri-stimulus colorimeter, G, R and B. These three coordinates are L, a and b. In the color space defined by this system, L is the vertical coordinate corresponding to lightness, while a and b are two rectangular cartesian coordinates which may be plotted on graph paper. Such a plot of a and b is called a chromaticity diagram and may be considered as a plan view of the color space or some portion thereof. Since plotting in three dimensions is next to impossible without the use of descriptive geometry, the third coordinate, L, may simply be shown as a number near the plotted point for the color on the chromaticity diagram, or it may be plotted on a separate lightness scale, which is actually an elevation view of the vertical axis of the color space. Fortunately, in many routine colorimetric problems, this time-consuming procedure of plotting the coordinates is unnecessary.

The logic of this system of color coordinates becomes apparent when the systematic arrangement of colors, relative to one another within the color

space, is noted. The vertical lightness axis, also known as the neutral, grey or achromatic axis, is perpendicular to the chromaticity diagram and is represented on this diagram by the point origin.

The range of colors, lying along this neutral axis, varies from black, at the bottom of the scale, through the neutral greys of increasing lightness to white at the top of the scale. Any horizontal cross section or plane in the color space contains all the points representing colors whose lightness is equal to that of the neutral grey at the intersection of the axis and this particular horizontal plane.

Any straight line, radiating from the origin of the chromaticity diagram, represents a vertical hue plane in the color space. All colors lying in this plane have the same hue. The hues of these vertical planes vary in a clockwise direction, through blues, greens, yellows, oranges, reds and purples, in the same order as the hues of the visible spectrum, starting at the blue end. The purples, which do not appear in the visible spectrum, are actually blends of blues and reds which lie near the ends of the spectrum. The radial horizontal distance that a color lies away from the neutral grey axis is a direct measure of its saturation. In other words, the further a color lies from the grey axis, the richer or more "colorful" it is.

The application of this system of interpretation to the data, provided by a sufficiently sensitive instrument, permits a degree of reproducible color discrimination which is at least equal, and in most cases, superior to that of a skilled colorist.

Specification of color

Any set of three colorimetrically determined coordinates would serve as a partial specification of a color, but in the specification of any other commodity to be purchased, it is necessary to show tolerances. In the modified Adams System, a color may be specified by stating its L, a and b values followed by the tolerance expressed as the upper and lower limits of each of these values. In effect, such a specification states that any color lying within the rectangular space, so described, would be an acceptable color match.

It should be remembered, however, that colors lying in the farthest corners of such a space might prove to be unacceptable color matches primarily because they are further from the standard at the centre of the space than are colors lying nearer the centres of the faces of such a space. For this reason, it is usually preferable to express the tolerance as a maximum distance from the standard in any direction. Such a tolerance yields a spherical space within which any color is an acceptable match.

Preparation of match samples

A supplier, attempting to meet such a specification, would determine the coordinates for a sample of the product he hopes to submit against the specification and would compare these coordinates with those of the specified standard. The comparison would be based on the straight-line distance between the standard and his sample. This straight-line distance represents the overall or total visual color difference, and it may be calculated from the equation:

$$\triangle E = \sqrt{(L_1 - L_2)^2 + (a_1 - a_2)^2 + (b_1 - b_2)^2}$$

where E is the total color difference expressed in the widely accepted units of color difference known as N.B.S. units after the National Bureau of Standards of Washington, D.C.

Because the accuracy may vary slightly from one instrument to another, it is advisable for the customer to supply,

to Page 83 →

Burn It!
Cowles Ty-Bond zinc phosphate coating will stay on the base metal—and protect it.
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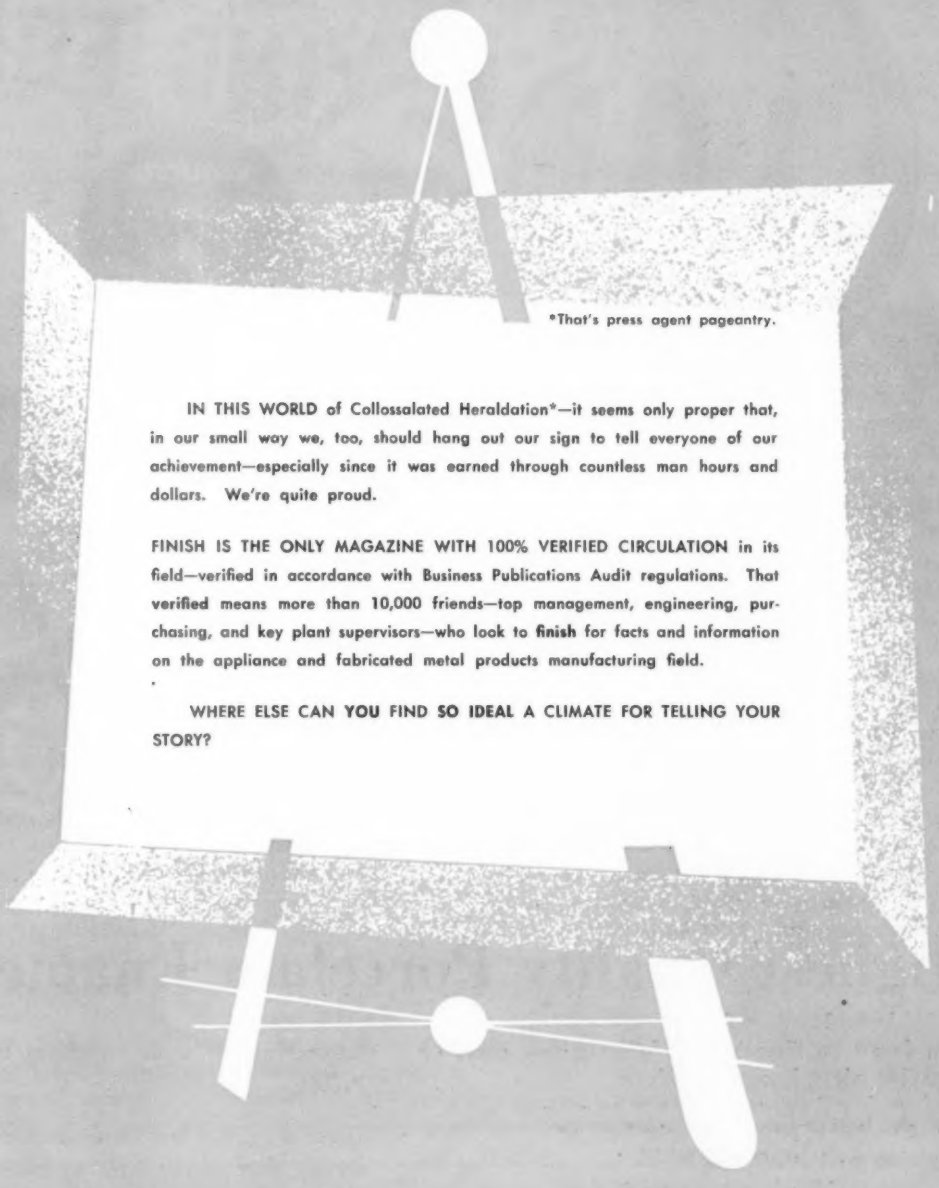
SPEAKING OF STATISTICS



*That's press agent pageantry.

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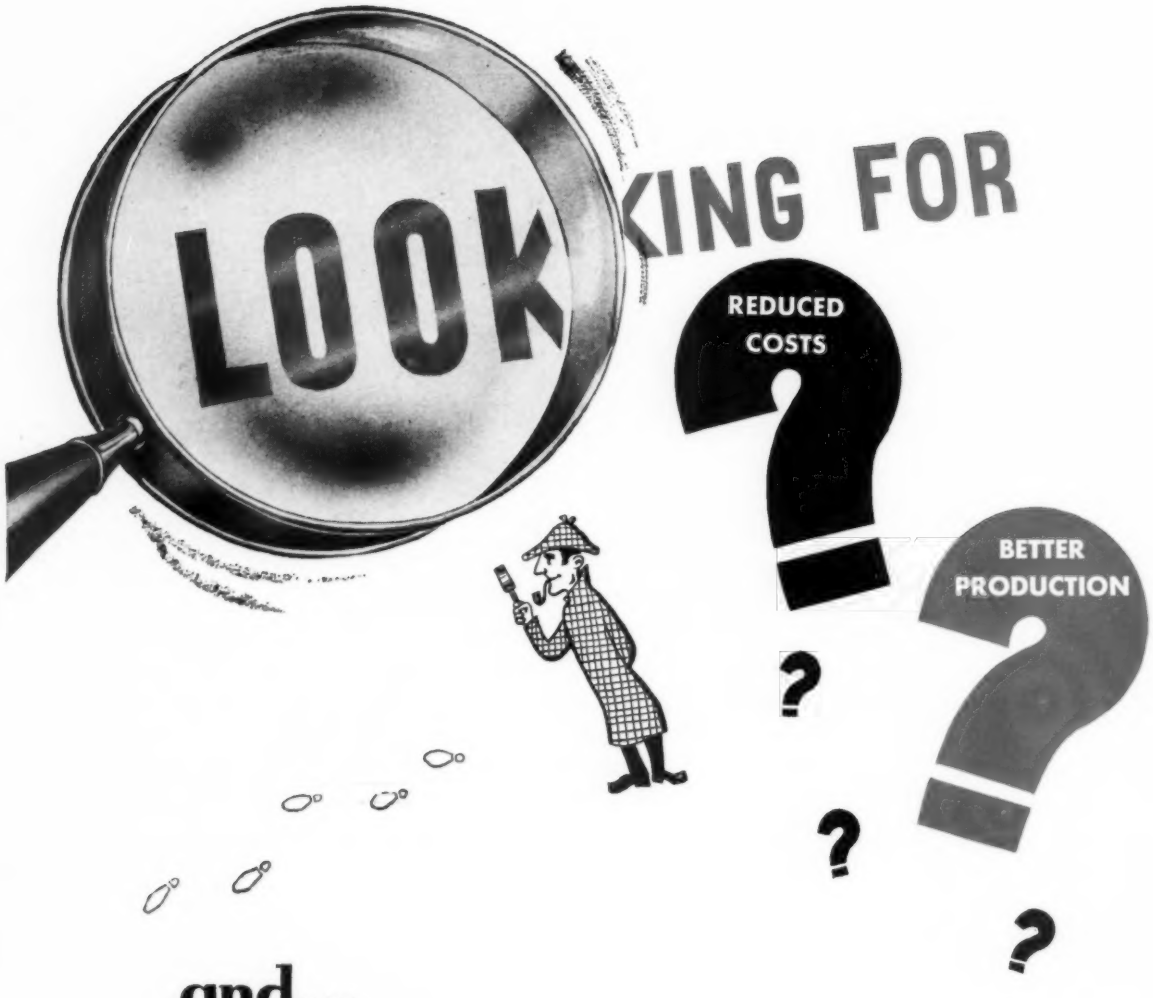

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Highest Quality Porcelain Enamel Frit?

Then you'll be interested in what a few users of HOMMEL FRITS have to say:

"We get better results on a larger percentage of all pieces with HOMMEL FRITS."

"Our production is up 14% and re-operation is down 9%." Previously we have had to use two cover coats. Now we're in top production with only one coat since switching to HOMMEL TITE-WITE!"

These are just a few statements taken from a recent survey that shows why so many enamelers are changing to HOMMEL granular, water quenched frits. If you are having production problems, let us show you what HOMMEL FRITS can do for you!

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as part of the specification, a specimen of the required color so that the manufacturer can compare his product with the standard on the same instrument. In this case, the specimen standard replaces the numerical standard, but the tolerance for the maximum total color difference remains the same. This practice minimizes arguments over the color acceptability of the product, and thus helps to maintain goodwill between the parties.

The application of colorimetry to production color control is very similar to its use in color specification. However, in the absence of a definite customer's specification for tolerance, it is necessary for the manufacturer to establish the tolerance. The tolerance must be set small enough to prevent customer rejects but, on the other hand, it should be as large as possible to minimize the cost of tinting. A colorimetric survey of past batches shipped to the customer will reveal an approximation of the maximum tolerance when any color complaints against these batches are considered.

Production color control

A phase of production color control where colorimetry is practically indispensable, is the maintenance of color standards. The modified Adams coordinates, L, a and b, should be determined for the material standard when it is first prepared. Then, at predetermined time intervals, a new material standard may be reprepared so that the original color values are reproduced. The time interval should be short enough that no appreciable color drift has occurred. The length of the interval, naturally, depends on the tendency of a given material to discolor with age, and it must be found experimentally.

Evaluation of color change

The degree of color change, exhibited by a product subjected to exposure or storage tests, can be evaluated simply by determining the total color difference ($\triangle E$) between the exposed and unexposed specimens of the material. Such a total color difference may be compared directly with those of other materials.

Personal taste a factor

However, there are times when taste enters into the problem of color change evaluation and, although two materials may discolor to the same degree, an experienced technician might prefer the direction in which one material changed over that of the other. In this case, he is obviously interested in the degree of color change in some particular direction or dimension rather than the overall or total color change.

Situations of this nature do not render colorimetry useless. On the contrary, it is a simple matter to plot the color points for the various specimens under consideration on the chromaticity diagram and lightness scale and, by comparing the lightness differences, saturation differences and hue differences individually with visual preferences, a close relationship will become apparent between visual preferences and one of these components of color difference or possibly a combination of two of them. Once the critical direction has been selected in this manner, a relatively simple mathematical equation expressing the degree of color change in this direction can be devised.

As an aid in the tinting process, this system of color measurement and interpretation indicates in what direction and to what degree the color of an off-color product must be changed to match the standard. This, in itself, is a considerable improvement over the visual practices of expert colorists because the human eye cannot measure the magnitude of color differences accurately and it even becomes confused in direction when the color differences are very small. The average number of tinting steps required per batch to match the standard is considerably reduced by objective colorimetry because the color difference evaluation is more precise and accurate.

Limitations to valve

However, colorimetry cannot directly provide information on the quantities of corrective colorants required to accomplish the matching of the standard. To do this, it is necessary to know the effects that the various colorants would have on the off-color product. That is, the direction and magnitude of the color change effected by a unit weight of a colorant must be known in advance.

The various methods that have been devised so far for systematically predicting the colorant composition in this manner have proven to be laborious and time-consuming. Nevertheless, it has been found that almost perfect color matches can usually be obtained in only two tinting steps with non-metallic colors.

The possible production savings, represented by the difference between two tinting steps per batch and the high average number of steps normally experienced without the aid of colorimetry, is certaintly sufficiently tempting to justify further investigation into reducing the cost of colorimetric tinting methods.

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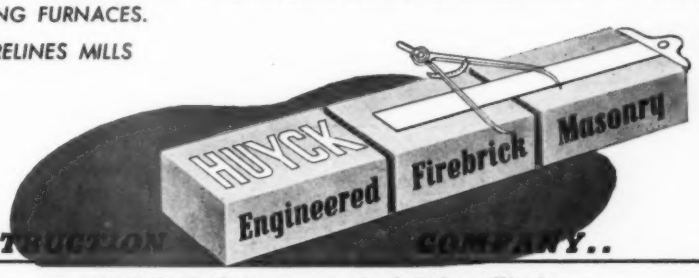

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Norge three-ring circus — *is launched by R. C. Connell, vice president of sales, Norge Div., Borg-Warner Corp. Parents who buy a Norge home appliance will be given the tent, four sideshows and other material for staging a backyard circus. Popping out of the tent are Jackie and Harold, midget clowns with Polack circus. Pressing her nose against the window is five-year-old Barbara Ruddy.*

Giant oven range — *is offered by Brown Stove Works for 1956. Features include copper escutcheon with concealed venting, electric clock with four-hour timer, 23" wide oven and drilled aluminum burner caps.*

finish . . .
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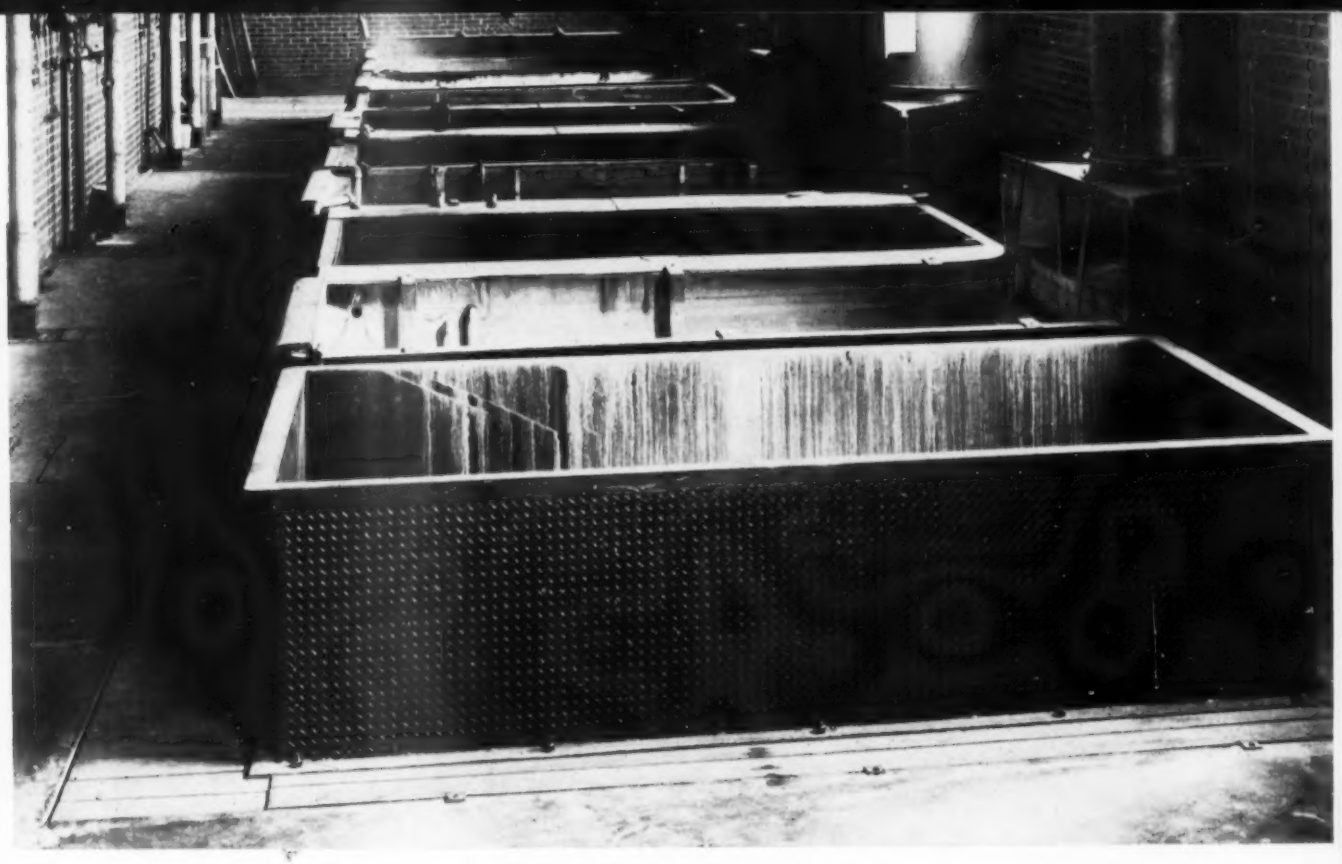
pictorial review of events of interest— current happenings about people and products in the appliance and metal products fields

Gold Toastmaster toaster — *commemorating the 50th anniversary of W. G. Steltz, Sr., (right), Supplee-Biddle-Steltz Co., is presented by Scott Rexinger, Toastmaster Products Div., McGraw Electric Company.*

Aluminum horizontal sliding window wall — *has been developed by Luria Building Products, Inc., Bristol, Pa. Believed to be largest horizontal sliding window wall ever designed, it eliminates exterior window-washing and glazing. It is manufactured in heights up to 5½ feet, with widths as required.*



Reduce heat-up time 75% with plate type heat transfer units

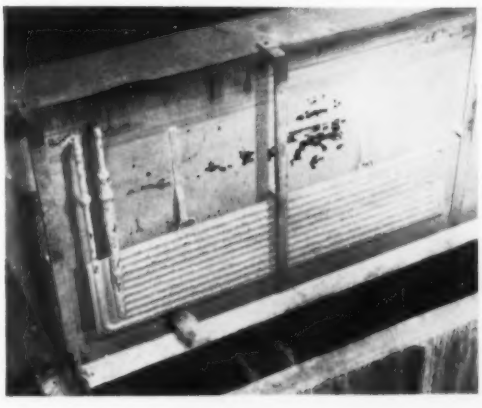
SAVINGS in heat-up time and in maintenance have been experienced by Athens Stove Works, Inc., of Athens, Tennessee, since installation of plate-type heat transfer units for heating water and solutions in pickling processes, according to F. O. Mahery, Jr.,* secretary and treasurer of the company.

Using steam at 45 pounds psi, the units heat 1,800 gallons of water in one tank from room temperature to boiling in 2 hours, saving 4 to 6 hours on heatup time alone when compared to former methods. The plate-type units, as employed for a variety of uses in the metal products field, consists of two embossed sheets of metal, welded together to form channels for passage of heating or cooling media.

Although the heating units were installed when the Athens plant was new, the experience of maintenance men with pipe coils used in the former plant indicates that the present heat transfer equipment requires 25% fewer maintenance hours.

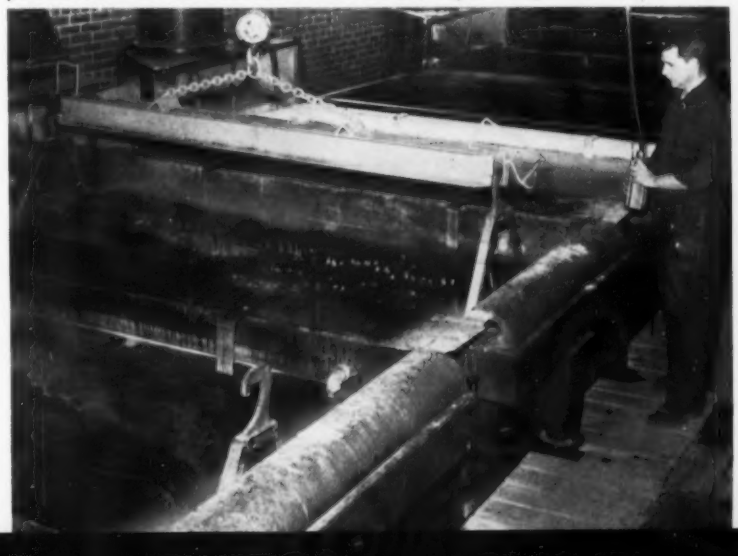
Presenting a relatively flat surface, the units are easily and quickly cleaned. Installed on quick-change hangers, they can be removed and replaced in the tank with very little loss of time. Ease of cleaning is especially important in the applications where corrosion is present.

*See "Two Years of Infra-Red Drying" and "Infra-Red Drying at Work on Porcelain Enamel at Athens Stove" by F. O. Mahery, Jr. in the December, 1954, and December, 1953, issues of *finish*.



Left: inside view of empty tank shows installation method for the plate type units employed for heating. Above: a view of pickling room at Athens, showing the 10 tank set-up including tank type drier. In order, the tank solutions are: 1 and 2, boiling cleaner; 3, hot rinse; 4, cold rinse; 5, sulphuric acid; 6, acid rinse; 7, nickel bath; 8, rinse; 9, neutralizer; 10, drier.

Manipulating the overhead hoist, the operator charges a load of stove parts into the No. 2 bath, which is heated by one of the transfer units.



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REDDIG IS WHITE SEWING MACHINE PRESIDENT

Edward S. Reddig, formerly executive vice president, White Motor Co., has been elected president of White Sewing Machine Corp., Cleveland.

SKINNER IS PHILCO PRES.

The board of directors of Philco Corp., Philadelphia, has elected James M. Skinner, Jr. president. He was formerly a vice president and general manager of the television division.

BORG-WARNER ANNOUNCES $25,000,000 EXPANSION

Borg-Warner Corp. plans to spend approximately $25,000,000 for expansion of its facilities during 1956, announced Roy C. Ingersoll, president and chairman of the board.

The Marbon Chemical Div. is building a $10,000,000 chemical plant in Washington, W. Va. The Byron Jackson Div. is constructing an electronics plant and laboratory in Santa Ana, Calif., and the Borg-Warner Research Center is being erected in Des Plaines, Ill.

In addition, an $11,000,000 plant of Borg-Warner Limited is being constructed in Letchworth, England.

TWO TO WESTINGHOUSE PORTABLE APPLIANCE POSTS

The appointments of Frank W. Loiko as national sales representative and of James E. Kerman as manufacturing supervisor for Westinghouse portable appliances were announced by John J. Anderson, manager of portable appliances, Westinghouse Electric Corp., Mansfield, Ohio.

NORGE CHICAGO BUYS 50,000 SQ. FT. BUILDING

Charles Hakimian, president, Norge Chicago Corp., has announced the purchase of a 50,000 square foot building in River Grove, Ill., to headquarter all warehousing, executive and sales administrative operations.

CARRIER NAMES HOFFMANN

Hermann C. Hoffmann has been named general sales manager of Carrier Corp.'s Machinery and Systems Div., Syracuse, N.Y., it was announced by Charles V. Fenn, vice president.

Hoffmann will have general responsibility for sales of large air conditioning and refrigeration equipment.

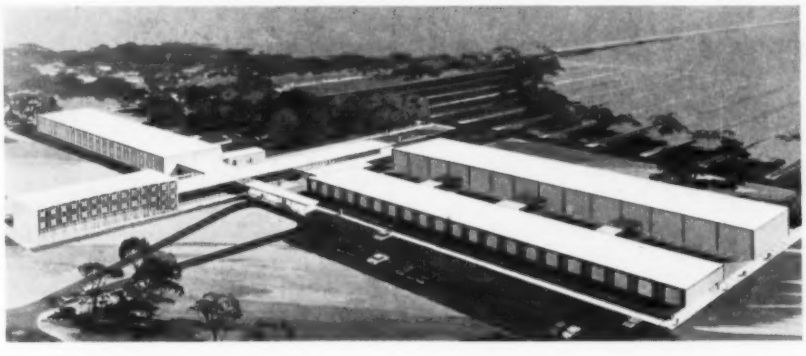
MITCHELL NAMES SCIRE, DIGIOIA TO ENG. POSTS

J. W. Alsdorf, president, Mitchell Mfg. Co., Chicago, has announced the promotions of Frank J. Scire, formerly chief engineer, to a newly-created post of director of engineering, and Louis DiGioia to chief mechanical engineer.

SLOAN, GM CHAIRMAN, RETIRES

Alfred P. Sloan, Jr., has retired as chairman of the board of General Motors Corp. He is succeeded by Albert Bradley, executive vice president.

CARRIER $12 MILLION EXPANSION PROGRAM



As a step in its expansion program, Carrier Corp. will spend $12 million during 1956 for new buildings and equipment at its Syracuse, N.Y., headquarters, according to Cloud Wampler, chairman of the board.

Plans call for new administration, personnel and research and development buildings costing about $5 million. Production facilities will be expanded at a cost of approximately $5.5 million. The remaining $1.5 million will be spent for miscellaneous purposes.

Total expenditures related to research and development will exceed $3 million.

Upon completion of the new buildings, the headquarters offices will be moved from their present location on Geddes Street to one adjacent to the main manufacturing facilities on Thompson Road northeast of Syracuse.

DIRECTORS APPROVE HUPP'S PURCHASE OF GIBSON

Directors of Hupp Corp. and Gibson Refrigerator Co. have approved an agreement whereby Hupp is to purchase the business and assets of Gibson.

The announcement was made by John O. Ekblom, chairman of Hupp's executive committee, and Gibson's chairman, Frank S. Gibson, Jr.

LOCKHEED PLANS $7,500,000 EXPANSION AT GEORGIA DIV.

Lockheed Aircraft Corp. plans to spend $7,500,000 during the next two years for an office building and research laboratories at its Georgia division at Marietta, Dan Haughton, Lockheed vice president and divisional general manager, announced.

BORG-WARNER, YORK CORP. PLAN TO MERGE

Borg-Warner Corp., Chicago, and York Corp., York, Pa., have announced merger plans whereby Borg-Warner would acquire all assets of York.

The board of directors of both companies have approved the merger, but it is subject to approval of York stockholders and clearance with Federal authorities.

***Annual George Westinghouse Awards** — for outstanding promotion of automatic laundry equipment by an electric utility are presented by Miss Betty Furness and Jack D. Lee (left), Westinghouse manager of laundry equipment. R. W. Smith (center) accepts second prize for Metropolitan Edison Co., and O. R. Williamson accepts first prize for Kentucky Utilities Co.*

RHEEM '55 SALES & EARNINGS

Sales and earnings of Rheem Mfg. Co., New York, in 1955 have been announced by Donald L. Rheem, board chairman, and Richard S. Rheem, president.

Sales totaled $160,619,990, and earnings totaled $5,243,580.

MAYTAG WAREHOUSE ADDITION

An addition will be built to the Maytag Central Service warehouse which will double the finished-product storage area, The Maytag Co., Newton, Ia., has announced.

The 75,000 square foot addition is scheduled for completion in early fall.

SERVEL 1ST QUARTER SALES 23% OVER 1955

Servel, Inc., Evansville, Ind., has announced that total sales for the three months ended Jan. 31 were $12,765,108, an increase of 23% over sales of $10,369,714 for the corresponding period last year.

VANCE, HIGDON, SCOUTTEN, NAMED MAYTAG VPs

Three vice presidents have been elected by The Maytag Co., Newton, Ia. They are R. E. Vance, secretary; E. G. Higdon, comptroller; and E. F. Scoutten, director of industrial relations.

DUPREE IS AMERICAN KITCHENS DIR. OF SALES

The appointment of K. O. Dupree as director of sales for American Kitchens Div., Avco Mfg. Corp., Connersville, Ind., has been announced by Curry Stoup, Avco vice president and general manager of the division.

Dupree formerly was general sales manager of Magic Chef, Inc., St. Louis.

ARI 1955 FIGURES

At least 130,000 U. S. homes were completely air-conditioned with central cooling units during 1955, an increase of 68.5% over the 77,150 residences air-conditioned the previous year, according to the Air-Conditioning and Refrigeration Institute.

MARQUARDT TO MODERNIZE PLANT & TEST FACILITIES

Marquardt Aircraft Co. will modernize and expand its research and development facilities at Van Nuys, Calif., with a construction program calling for an expenditure of nearly $6,000,000, Roy E. Marquardt, president, announced.

Largest expenditure will be for modernization of the Marquardt Jet Laboratory, under U. S. Air Force sponsorship. Miscellaneous small buildings will be constructed and additional office space will be leased to provide for an over-all expansion of aproximately 40% in floor space.

VACUUM CLEANER FEB. SALES

Factory sales of standard-size household vacuum cleaners in February totaled 286,386 units, 9.6% above the 261,183 cleaners sold in February 1955, according to the Vacuum Cleaner Manufacturers' Association.

February was the nineteenth consecutive month in which the output broke a record for that month which had stood from three to eight years.

IBM APPOINTS McCALL

Edward L. McCall has been appointed general manager of the Greencastle, Ind., manufacturing plant of IBM Corp.

FRIGIDAIRE TO MAKE OIL-GAS RESIDENTIAL HEATING EQUIPMENT

Frigidaire Div., General Motors Corp., Dayton, Ohio, is expanding its air conditioning lines to include oil and gas-fired residential heating equipment, according to Mason M. Roberts, General Motors vice president and head of division.

Roberts reports that the furnace industry expects to sell more than 1,850,000 units in 1956.

The new line of furnaces will include 18 gas and seven oil models.

NEMA 1955 FIGURES

The National Electrical Manufacturers Association has announced the following sales figures for 1955; electric household refrigerators, 3,685,166; electric ranges, 1,259,636; electric farm and home freezers, 692,644; and electric storage water heaters, 664,884.

WESTINGHOUSE EXPECTS '56 SALES TO SET NEW RECORDS

John W. Craig, vice president and general manager, Westinghouse electric appliance divisions, has stated that in the remaining months of 1956 Westinghouse expects to do a production and sales volume in appliances that will exceed production and sales in any previous 12-month period.

HASTINGS HEADS AMERICAN KITCHENS CONTRACT SALES

C. Fred Hastings, general sales manager of American Kitchens Div., Avco Mfg. Corp., Connersville, Ind., has been named to the newly created post of general manager of defense and contract sales, Curry Stoup, division general manager, announced.

Hastings will direct manufacturing contracts in the government products department and the dishwasher and kitchen cabinet fields.

G.M. TO BUILD CALIF. PLANT

Harlow H. Curtice, president, has announced that General Motors will build a new Buick-Oldsmobile-Pontiac assembly division plant in Sunnyvale, Calif., at an estimated cost of 50 million dollars.

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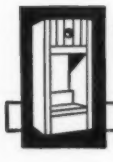

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SCHWARTZWALDER IS AMERICAN CERAMIC SOCIETY PRESIDENT

Karl Schwartzwalder, director of research, AC Spark Plug Div., General

Motors Corp., has been elected '56-'57 president of The American Ceramic Society.

He is the holder of 25 patents in the field of metals and ceramics. During World War II he was scientific consultant on the Manhattan Project that developed the atomic bomb.

SERVEL UPS McCULLOUGH, HON

Promotion of Wilfred W. McCullough to development engineer for Servel, Inc., Evansville, Ind., has been announced by A. B. Kennison, vice president and coordinator of research and product development.

McCullough was formerly supervisor of the quality control test laboratory and will be succeeded in that capacity by Kenneth C. Hon.

PRESIDENT EISENHOWER SETS JOB SAFETY WEEK

President Eisenhower has called upon the nation to observe Job Safety Week, May 13-19.

During that week, leaders of American business, labor, agriculture, State and Federal agencies, insurance, education and private safety organizations will gather in Washington for the President's Conference on Occupational Safety.

ASTM HOLDS 59TH ANNUAL MEETING JUNE 17-22

Subjects relating to research and testing of engineering materials will be discussed at the 59th Annual Meeting of the American Society for Testing Materials to be held at Chalfonte-Haddon Hall, Atlantic City, N.J., June 17-22.

On the program are Dr. Charles E. Reed, general manager, Silicone Products Dept., General Electric Co., who will deliver the Edgar Marburg Lecture, and Dr. D. K. Crampton, director of development, Chase Brass and Copper Co., who will give the Gillett Memorial Lecture.

WESTINGHOUSE UPS TWO IN REFRIGERATION SPECIALTIES

The appointment of H. R. Bryant as sales manager for Westinghouse refrigeration specialties and of C. W. Paulson as manager of the room air conditioner department have been announced by H. F. Hildreth, manager, refrigeration specialties.

Formerly, Bryant was manager of the room air conditioner department, and Paulson was assistant to Hildreth.

PEI HOLDS MEETING

The visit of Glenn Hutt, president, and John C. Oliver, managing director, highlighted the April 13th meeting of the Porcelain Enamel Institute in Los Angeles.

PEI West Coast members held the informal meeting to discuss topics of interest to the industry.

WHIRLPOOL-SEEGER NAMES 2 PRODUCT DIV. GEN. MGRS.

Appointment of two product division general managers for Whirlpool-Seeger Corp., St. Joseph, Mich., was announced by John A. Hurley, vice president.

Sol Goldin, formerly range division product manager, has been named general manager of the range division. Lincoln M. Larkin, formerly industrial division sales manager, has been named general manager of the air conditioner division.

GAS RANGE, FURNACE & WATER HEATER SALES UP IN FEB.

Edward R. Martin, Gas Appliance Manufacturers Association, director of marketing and statistics, reports that shipments of domestic gas ranges during February totaled 184,000 units, 21.3% over January.

Shipments of automatic gas water heaters totaled 251,200 units, 10% above February, 1955.

Gas furnace shipments totaled 51,700 units, 8.4% over the same month last year.

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Metal sheets, automatically separated, picked up and advanced one at a time to feeding—in point of machine to which it is attached at speeds up to 150 sheets per minute.

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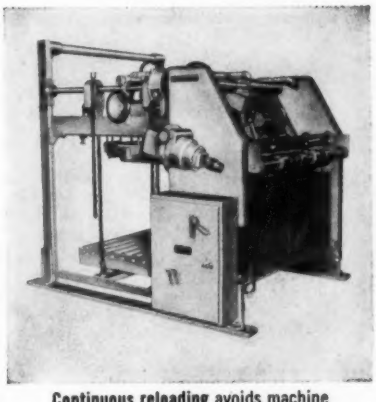
Standard Feeder handles metal sheets from 14" x 18" up to 36" x 44" between 24 and 38 gauge stock. Feeders for larger size and heavier gauge metal sheets also available.



Continuous reloading avoids machine stoppage. New loads are placed in feeding position, while machine is operating, thus maintaining continuous automation cycle.

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INVISIBLE WELDS
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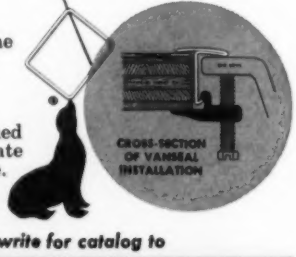

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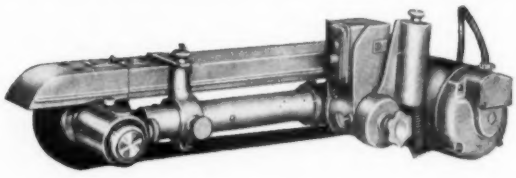

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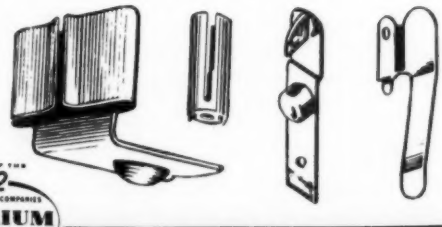

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FEB. HOME LAUNDRY APPLIANCE SALES UP 19% OVER 1955

Home laundry appliance factory sales for February totaled 558,669 units, 19% over February 1955, Guenther Baumgart, executive director, American Home Laundry Manufacturers' Association, has announced.

Automatic clothes dryers showed the greatest sales gain as compared with February 1955. Gas dryers were up 49%, and electric dryers were up 31%.

SAMUEL STAMPING NAMES KIMBERLEY ENG. HEAD

W. R. Kimberley has been named director of engineering for Samuel Stamping & Enameling Co., Chattanooga, Tenn., announced Charles H. Dickas, vice president and general manager. Kimberley was formerly associated with Holland Furnace Co., Holland, Mich.

WHIRLPOOL-SEEGER NAMES TWO PURCHASING AGENTS

Promotion of two officials to purchasing agent posts at the St. Joseph, Mich., division of Whirlpool-Seeger Corp., has been announced by M. R. Denison, division director of purchases.

David F. Upton and Leonard J. Hardke have been named purchasing agents to head separate components buying and expediting sections in the purchasing department.

PMI SALES CLINIC FOR METAL STAMPERS

H. A. Daschner, managing director, Pressed Metal Institute, announces that a National Sales Conference for metal stamper's sales managers and their salesmen will be held at the Hotel Carter in Cleveland, Ohio, June 22.

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. . . with versatile, low-cost malleable castings.

Whether your requirements call for a casting large—or delicate, you can easily slash production, machining and assembly costs because Albion's malleable casting techniques offer a complete freedom of design with the elimination of excess metal and finishing time.

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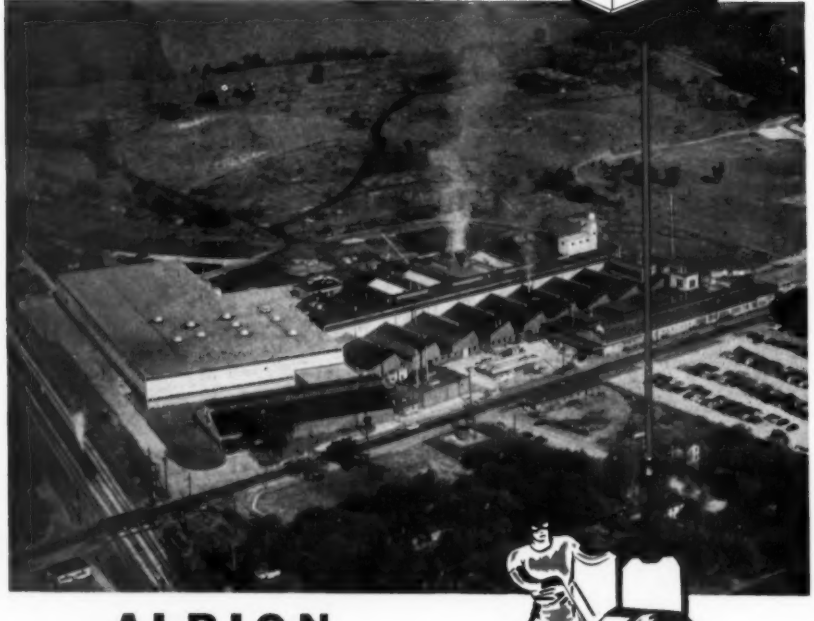

ALBION MALLEABLE IRON CO.

ALBION, MICHIGAN

62 SMITH FAMILIES WIN PERMAGLAS WATER HEATERS

Sixty-two babies born to Smith families in the United States on February 14 have won free water heaters for their parents, according to Permaglas Div., A. O. Smith Corp., Kankakee, Ill. These babies were born on the day the 3,000,000th glass-lined water heater was produced by the division.

NEW ASTE OFFICERS

Howard C. McMillen has been elected president of the American Society of Tool Engineers to succeed Dr. Harry B. Osborn, Jr. McMillen is plant manager of Philco Corp.'s Bedford, Ind., plant, and Osborn is technical director of TOCCO Div., Ohio Crankshaft Co.

Other new officers are H. E. Collins, first vice president; G. A. Goodwin, second vice president; Wayne Ewing, third vice president; H. Dale Long, fourth vice president; John X. Ryneska, treasurer; and William Moreland, secretary.

PLUMBING-HEATING-COOLING MONTH SET FOR AUGUST

Wilbur S. Hokom, chairman of the Special Coordinating Committee of the All-Industry Plumbing and Heating Modernization Committee, announces that August has been chosen as Plumbing - Heating - Cooling Month.

TEMCO AIRCRAFT '55 SALES

Temco Aircraft Corp., Dallas, Texas, net sales for 1955 were $78,224,390, 32.1% over the total for 1954 and more than $6 million greater than sales for 1953, the previous high year.

BENDIX AVIATION EXPANSION

Bendix Aviation Corp. has started construction of two new facilities in Palmdale, Calif., for the testing and servicing of equipment for military air bases and manufacturers of jet aircraft.

2 NEW GAMA MEMBERS

Two companies recently elected to membership in the Gas Appliance Manufacturers Association are the Basford Mfg. Co., San Francisco, Calif., and the Sandberg Mfg. Co., Portland, Oregon.

RYAN 1ST QUARTER FIGURES

Sales of $10,612,475 and net income of $360,261 have been reported by Ryan Aeronautical Co., San Diego, Calif., for the first quarter of the 1956 fiscal year.

VASQUEZ IS COORDINATOR OF PACKAGING SHORT COURSE

Stephen W. Vasquez, Dean of the School of Commerce and Finance of St. Louis University, has been named coordinator of the annual technical short course to be conducted by the university for the Society of Industrial Packaging and Materials Handling Engineers, October 22-25.

The short course will be held in the Kiel Auditorium in St. Louis in conjunction with the annual Protective Packaging and Materials Handling Competition and the Industrial Packaging and Materials Handling Exposition.

WHIRLPOOL-SEEGER APPT.

Ben F. Donaldson has been appointed assistant product manager of the refrigeration division of Whirlpool-Seeger Corp., St. Joseph, Mich., announced Lee H. D. Baker, refrigeration division general manager.

NORGE DEALER SALES UP 21% IN JAN. & FEB.

Sales to dealers in January increased 21% above the 1955 months to reach a new high for the period, Norge Div., Borg-Warner Corp., Chicago, has announced.

SIMMONS RETIRES AS BIRTMAN ELECTRIC VP

Richard J. Simmons, vice president, Birtman Electric Co., Chicago, retired on April 1. He had been with Birtman for 33 years.

STEVENS TO WHIRLPOOL-SEEGER MERCHANDISING POST

Appointment of George T. Stevens to the position of director of merchandise development for Whirlpool-Seeger Corp., St. Joseph, Mich., has been announced by John A. Hurley, vice president.

Since 1948, Stevens had headed his own firm, George T. Stevens & Associates, Chicago, distributor of built-in ovens and ranges and sales representative for vacuum cleaners.

AMERICAN WELDING SOCIETY ELECTS 1956-57 OFFICERS

John J. Chyle, director of welding research, A. O. Smith Corp., has been elected president of the American Welding Society for the 1956-57 fiscal year beginning June 1.

First vice president is Clarence P. Sander, general superintendent, Vernon Plant, Consolidated Western Steel Div., United States Steel Co.

Second vice president is Gustav A. Hoglund, head of welding section, Alcoa Process Development Laboratory, Aluminum Co. of America.

NEMA FILMS HEATING STORY

The electric heating story has been put on film by the Electric House Heating Equipment Section of the National Electrical Manufacturers Association, announced Robert E. Pequignot, section chairman.

NORGE NAMES McDAVITT

Harry G. McDavitt has been named conventional washer sales manager of Norge Div., Borg-Warner Corp., Chicago, announced R. C. Connell, vice president of sales.

McDavitt was formerly advertising and sales promotion manager for Apex Electrical Mfg. Co., Cleveland.

Ashdee

Automatic Electrostatic Finishing System

Small and odd shaped parts can be grouped and finished with amazing speed in the Ashdee system as with these automobile parts.

Steel hose reels are quickly and efficiently sprayed in this Ashdee installation. Flush panel spray gun stands house the controls.

■ More and more manufacturers with metal part finishing operations are turning to the advantages of Ashdee electrostatic finishing. With the Ashdee system, paint particles are attracted to the product by a high voltage electrostatic field that drastically reduces paint waste, eliminates manual spraying, gives faster production speeds and higher quality.

FREE ENGINEERING SERVICE

Ashdee engineers will test-run your products and show you estimates of savings without obligation. If necessary Ashdee will provide complete laboratory facilities at no cost to you.

GET THE FACTS

YOU CAN OWN OR LEASE AN ASHDEE SYSTEM. Start now to reduce your finishing costs. Write for the new Ashdee case history file that gives you positive evidence that the Ashdee Electrostatic Finishing System is a wise investment.

Sales and Service Representatives in Most Major Cities

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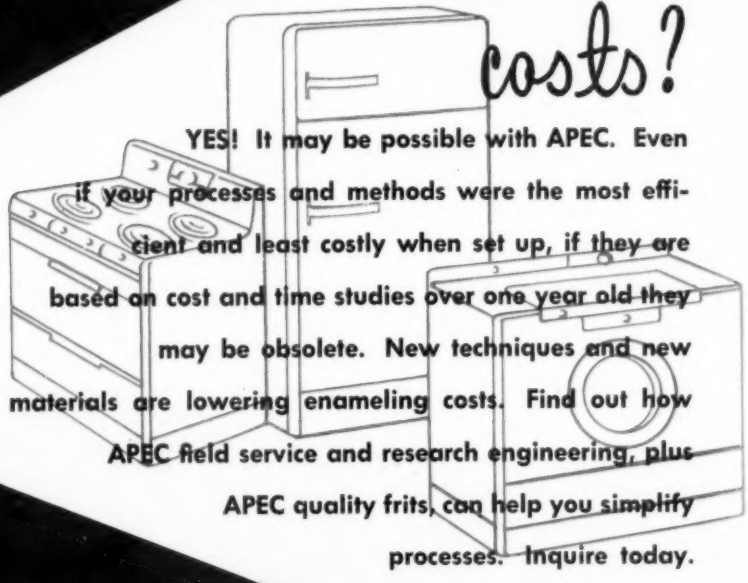
CONTINUING PROGRESS IN PORCELAIN ENAMEL PRODUCTS

CONSISTENT HIGH QUALITY

EXPERT FIELD SERVICE

FINISHES THAT CUT PRODUCTION COST . . . BUILD SALES APPEAL

Cut ENAMELING costs?



YES! It may be possible with APEC. Even if your processes and methods were the most efficient and least costly when set up, if they are based on cost and time studies over one year old they may be obsolete. New techniques and new materials are lowering enameling costs. Find out how APEC field service and research engineering, plus APEC quality frits, can help you simplify processes. Inquire today.

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New Industrial Literature

510. Plating waste treatment and chrome recovery

New A case history discusses the method used to obtain water re-use and metal recovery and the dollar savings realized after the waste treating equipment was put into operation. The article goes into the details of the plant operation, the design of the recovery system, the operational cycle and the benefits derived. In addition to photographs, there is a flow diagram of the waste treatment plant.

511. Rotary spray gun machine and rotary wiper

New A new brochure on an automatic rotary gun spray painting machine and an automatic rotary wiping machine is now available. It includes illustrations and complete descriptions. The paint of round and deep-draw parts, which have been difficult to hand spray because of their intricate design, is said to be easy and economical with the rotary gun machine. The rotary wiper is designed for high production wiping of excess paint from stove, heater and refrigerator knobs, etc. after mask-controlled spraying.

512. "Precision Metals Services"

New A special service to the metallurgical industries — the production and processing of made-to-order metals in experimental quantities — is described in a 16-page booklet. Entitled "Precision Metals Services", the illustrated booklet describes the facilities of a pilot plant for producing small (10-pound) ingots by regular or vacuum melting, and for forging, annealing, heat treating, rolling and drawing the resultant metal. It also includes a list of special metal producing and processing functions which the service will provide.

513. Manual on nickel plating

New An illustrated 20-page instruction manual on bright nickel plating is offered. Three techniques for electro-depositing are described: Type I for use in still tanks or with conveyors where work loads are in mild motion; Type II for use with air agitation; and a barrel process for plating in cylinders. The manual explains the proper bath preparations for these processes, solution maintenance, purification, handling of equipment and materials. Analytical procedures for all of the constituents, including the addition agents, are outlined. Plating of special equipment is described and illustrated.

514. Booklet on solution filters

New A 2-color bulletin on a line of filters is being offered. Back washing which requires no air or additional equipment is a feature of the filters. Another feature is that all parts which come in contact with solutions are made of plastic or stainless steel, which are corrosion-resistant. Filtering is accomplished at a higher speed, according to the manufacturer. The filters can be moved without the use of dollies or lift trucks.

515. "How to Strip Paint"

New Paint removal by the application of alkaline or solvent materials is the subject of a recently revised booklet, "How to Strip Paint". The booklet describes the procedures followed in four different stripping methods — steam gun, hot flow-on, cold spray and tank. It tells which materials should be used for specific types of paint, enamel and lacquer. The booklet also discusses ways to protect stripped parts from rust in storage and how to prepare them for repainting to prevent future rusting.

516. Fire protection catalog

New A highly illustrative catalog covering the various generally accepted methods of fire detection, fire prevention, fire control and fire extinguishment associated with the field of fire protection has been published.

517. Marking with steel dies

New A manual regarding marking with steel dies contains a section dealing with basic information on the use and selection of steel dies for every application; a section on steel stamping, embossing and foil leaf marking dies; a section on press-style type holders, tool post holders for marking around the peripheries of cylindrical or round-tapered parts; and numbering heads for embossing or debossing.

518. Handling news

New Reports on new products and new applications in the conveyor field are available in a monthly publication issued free of charge. The tabloid size newspaper presents in each issue new ideas for conveyor application and case histories of unusual installations, descriptions of new and forthcoming conveyor and caster types and designs.

519. Abrasive belt grinding

New "How Abrasive-Belt Grinding Increases Production", a new 31-page booklet consisting of 46 illustrated case histories, has been announced. Application studies are grouped according to each of five types of abrasive belt machining — platen, contact wheel, centerless and flexible belt, and cover a wide range of materials — ferrous and non-ferrous metals, glass, wood and plastics.

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Elmhurst, Illinois

Please forward to me at once information on the new supplies and equipment and new industrial literature as ennumerated below:

No._____ No._____ No._____ No._____

No._____ No._____ No._____ No._____

Name _____ Title _____

Company _____

Company Address _____

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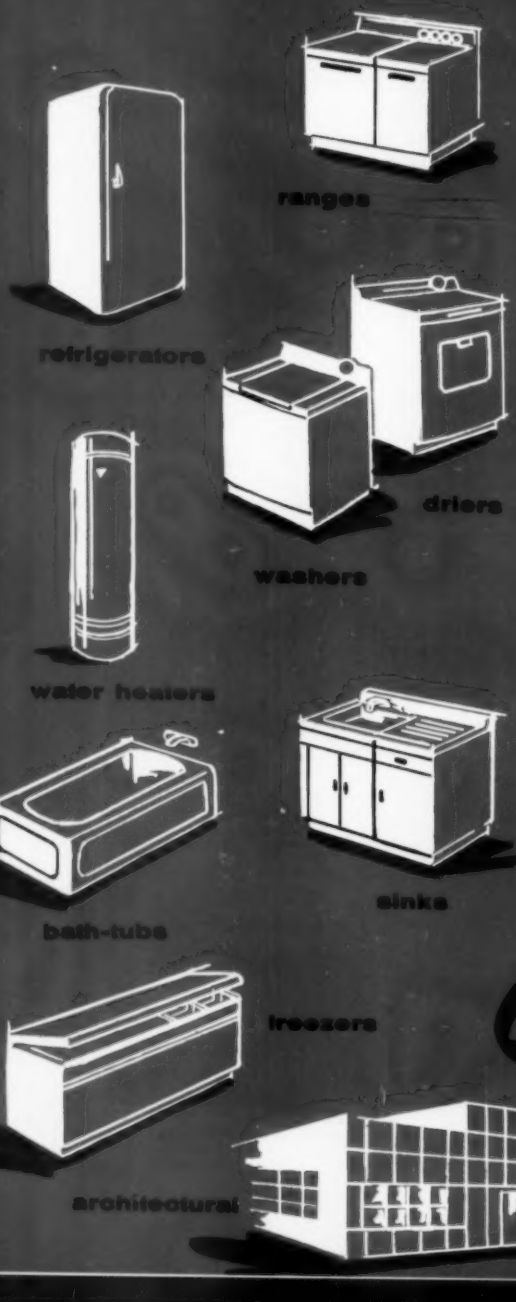


Working side by side with enamel plant personnel is a part of Chicago Vit service that can't be measured in terms of dollars and cents. But it's important to the enamel plant operator, and it encompasses every phase of enamel processing. Chicago Vit customers have learned that this specialized service has helped them to reduce costs and increase production in many ways year in and year out. And the beauty of it all is that it's never further away than the nearest telephone.

FOR FINEST FRIT – CHICAGO VIT

Chicago Vitreous CORPORATION

1425 South 55th Court Cicero 50, Illinois

NEWS about Suppliers

RUSSELL C. MAHON DIES

Russell C. Mahon, founder and chairman of the board of The R. C. Mahon Co., Detroit, died at his home on March 30.

From the small roofing busines he started in 1912, Mahon developed the organization which today is comprised of eight divisions and employs 3,000 people.

ROLL IS TECUMSEH VP

It is reported that R. C. Roll, formerly vice president, Betz Corp., Hammond, Ind., has joined Tecumseh Products, Tecumseh, Mich., as a vice president.

YOUNGSTOWN SHEET 1,000,000 TON STEEL EXPANSION

The Youngstown Sheet and Tube Co., Youngstown, Ohio, has announced an expansion program that will add one million tons of steel ingots to its annual capacity in the next two years and sharply increase its steel finishing output. The company's present annual steelmaking capacity is 5,750,000 tons.

According to the report, plans for increases in finishing capacity include facilities in both the Chicago and Youngstown districts.

FOOTE — ELECTRO MANGANESE EXCHANGE COMPLETED

Foote Mineral Co., Philadelphia, announces that the exchange of shares for the assets and business of Electro Manganese Corp. has been completed. The operations of Electro Manganese in Knoxville are being handled as a division of Foote.

ALCOA TO BUILD $45 MILLION PLANT IN TEXAS

Aluminum Company of America will build a $45 million plant at Point Comfort, Texas, for the production of alumina.

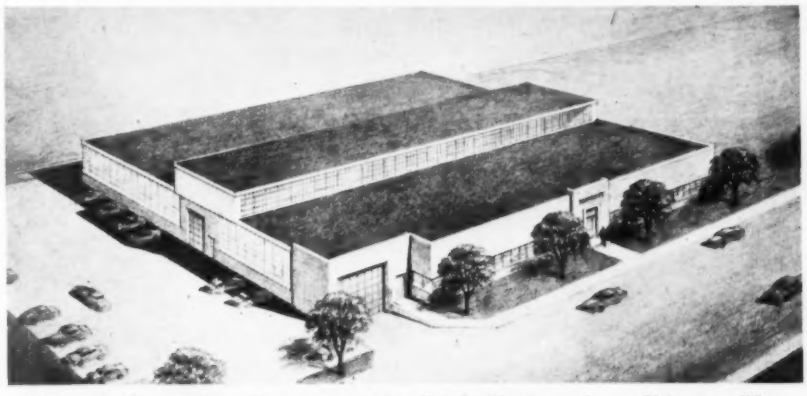
CALMASTER IS TUTTLE ELECTRIC DIVISION

D. V. Tuttle, president, Tuttle Electric Products, Inc., announces that a licensing agreement has been consumated with Calmaster, Inc. which provides for the transfer of all Calmaster sales and manufacturing operations from Lakewood, Ohio, to the Tuttle plant in Kirkland, Ill. Calmaster will be operated as a division of Tuttle Electric.

PENNSALT EXPANSION PROGRAM

Pennsylvania Salt Mfg. Co., Philadelphia, has announced a five-year expansion, development and improvement program involving an expenditure of approximately $55,000,000.

The program provides for the introduction of new products and processes, the expansion of production of present products, the installation of more efficient facilities and the improvement of existing processes.



***New Burdett Mfg. plant** — at 4920 South Monitor Ave., Chicago. This 34,000 sq. ft. plant provides an increase of 100% in manufacturing floor space. Additional property enables future expansion which will double the company's capacity.*

U. S. STEEL EDUCATIONAL GRANTS TOTAL $300,000

United States Steel Foundation, Inc., Chicago, has announced pledges totaling $300,000 to the University of Chicago, Northwestern university and Illinois Institute of Technology. The institutions will receive unrestricted grants of $100,000 each towards endowment, building fund or other facilities needs to be used at their discretion.

VITREOUS STEEL SETS 7 YEAR SAFETY RECORD

The Vitreous Steel Products Co., Nappanee, Ind., announces that as of February 1, 1956, the company had completed seven consecutive years without a lost-time accident.

NEW INTERNATIONAL PAPER PLANT ON WEST COAST

Plans for construction in San Jose, Calif., of a new converting plant for the production of corrugated fibre shipping containers have been announced by Arthur B. Damon, general manager, Container Div., International Paper Co.

Plans call for an overall plant area of about 160,000 square feet, including office and roll stock warehouse designed to accommodate 4,000 tons of kraft container board and Chemfibre corrugating medium.

GAULT HEADS ROBERTSHAW'S COOKING APPLIANCE CONTROLS

M. B. Gault has been appointed general sales manager of the cooking appliance controls division of Robertshaw-Fulton Controls Co., Greensburg, Pa., announced C. M. Stainton, vice president and director of sales.

Gault was formerly supervisor of sales of gas appliance controls for cooking applications.

BASIC REFRACTORIES CHANGES NAME TO BASIC, INC.

At their annual meeting in March the stockholders of Basic Refractories, Inc., Cleveland, approved changing the company's name to Basic, Inc.

FEB. RESISTANCE WELDING ORDERS UP 12% OVER JAN.

The Resistance Welder Manufacturers' Association, Philadelphia, announces that new orders in February totaled $6,217,000, 12% over January.

AMERICAN CHEMICAL PLANT TO OPEN MISSOURI PLANT

The American Chemical Paint Co., Ambler, Pa., announces that it has acquired office and plant facilities in St. Joseph, Mo., and expects to be operating about June. Heading the St. Joseph branch will be J. H. Abrams.

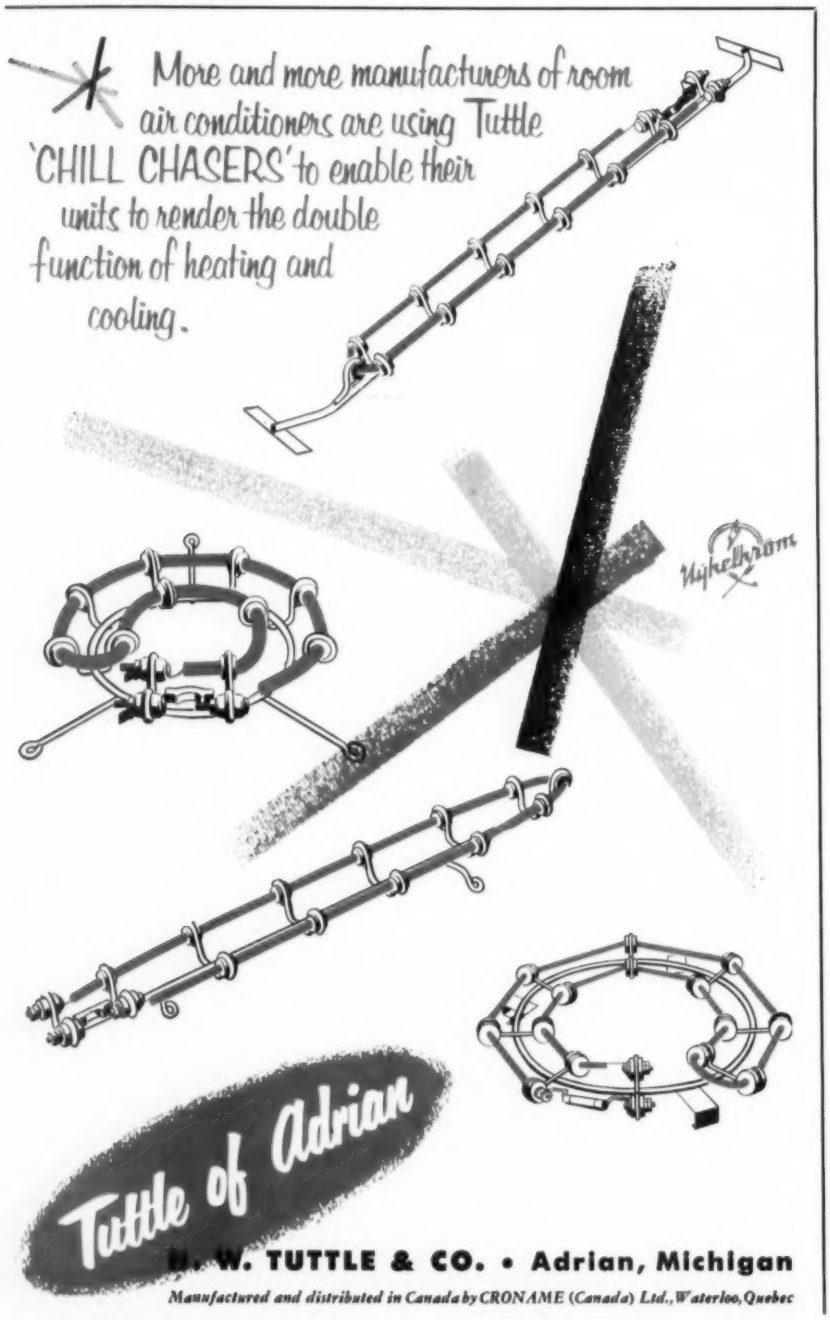
EPLER TO U. S. STEEL SUPERVISOR POST

Edward P. Epler has been appointed supervisor, service metallurgy, carbon bar and semi-finished materials for United States Steel Corp., Chicago, announced Richard W. Simon, chief metallurgical engineer.

Epler, formerly chief development metallurgist at the Gary Steel Works, succeeds Thomas D. Hayes, retired.

BLISS BUYS MATTESON

The purchase of controlling interest in Matteson Equipment Co., Inc., Poland, Ohio, by E. W. Bliss Co., Canton, Ohio, has been announced. Matteson will operate as a Bliss subsidiary.


More and more manufacturers of room air conditioners are using Tuttle 'CHILL CHASERS' to enable their units to render the double function of heating and cooling.
Hydrotherm
Tuttle of Adrian
H. W. TUTTLE & CO. • Adrian, Michigan
Manufactured and distributed in Canada by CRONAME (Canada) Ltd., Waterloo, Quebec

DARRAH IS PATTERSON VP & SALES MANAGER

Richard L. Cawood, president, The Patterson Foundry & Machine Co., East Liverpool, Ohio, has announced the appointment of Richard D. Darrah as vice president and sales manager.

Darrah was formerly sales manager for the Industrial Conditioning Div. of Dravo Corp.

R. D. DARRAH

GEORGE PETERS

SPEE-FLO NAMES PETERS DIRECTOR OF PROMOTIONS

George Peters has been named director of promotions for the Spee-Flo Co., Houston, Texas, according to G. S. Levery, president.

Peters, who has been associated with publicity, advertising and sales promotion fields for the past 15 years, will coordinate and direct publicity and advertising for the company.

CENTURY VIT EXPANSION

According to H. C. Emberson, president, Century Vitreous Enamel Co., Chicago, plans have been completed for expanding the company's laboratory and plant facilities. Plans for the frit laboratory call for addition of equipment and personnel for expanded research and development work.

PITTSBURGH PLATE APPT.

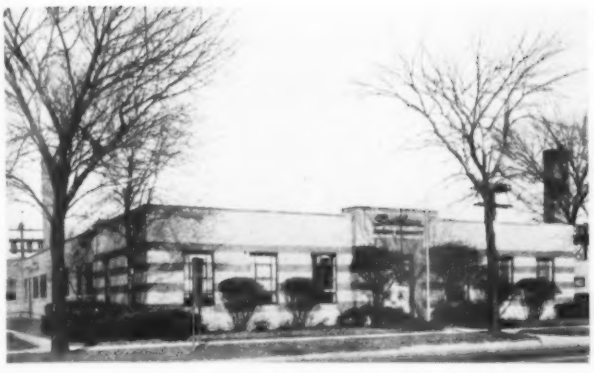
Appointment of Earl J. Jacqmain as manager of Pittsburgh Plate Glass Co.'s Saginaw, Mich., distributing branch has been announced by Donald C. Burnham, vice president, merchandising division.

WASHBURN OF GAYLORD DIES

George E. Washburn, for many years manager of the Los Angeles office of Gaylord Container Corp., division of Crown Zellerbach Corp., passed away March 22 in Los Angeles.

PENNSALT NAMES PICKETT, BLITZ

The Pennsylvania Salt Mfg. Co., Philadelphia, has announced the appointments of Wiley J. Pickett and Arnold E. Blitz to its technical sales staff.



***Southern Screw Chicago warehouse** — is located at 4240 W. Peterson Ave. Shipping and receiving are located to the rear of the building. This new building almost doubles the floor space of the previous warehouse.*

ACME STEEL OFFICE BUILDING

Ground was broken on March 1 at Acme Steel Co. for construction of a new $1,500,000 office building in Riverdale, Ill., which will house all remaining offices and the 350 personnel now located at 2840 Archer Ave., Chicago.

The building is expected to be ready for occupancy late in 1956.

KAISER ALUMINUM EXPANDS LOUISIANA REDUCTION PLANT

Kaiser Aluminum & Chemical Corp. has announced the expansion of the primary aluminum capacity of its Chalmette, La., reduction plant by 55 million pounds annually.

LUDDY JOINS NATIONAL WOODEN BOX ASSN.

The National Wooden Box Association has announced the addition to its staff of Thomas J. Luddy, formerly packing and packaging technologist with the Bureau of Ships, U. S. Navy Department.

REYNOLDS UPS KEENER

William H. Keener has been named special representative for the executive sales division of Reynolds Metals Co., with headquarters in Washington, D. C.

GAYLORD'S WILLIAMS DIES

Ben M. Williams, manager of sales promotion for Gaylord Container Corp., division of Crown Zellerbach Corp., St. Louis, passed away on March 23.

KAISER METAL PRODUCES PE STEEL PANELS FOR HOTEL

Kaiser Metal Products, Inc., Bristol, Pa., announces it has started production on several thousand vitreous enameled steel panels for the exterior of Philadelphia's new Sheraton Hotel, now under construction.

The hotel will have a combination of aluminum, glass and porcelain on its exterior. One set of panels will be a solid slate gray, to be installed where the elevator shafts break the continuity of the window pattern. The greater portion of the walls will be covered with panels having a gray-green stipple.

DOEHLER-JARVIS EXPANSION

An expansion program which will increase the capacity of the die casting facilities of the Doehler-Jarvis Div. of National Lead Co., by 20,000,000 pounds of aluminum and 15,000,000 pounds of zinc per year has been announced by Joseph A. Martino, president of National Lead.

TITANIUM METALS EXPANDS SPONGE PRODUCTION

National Lead Co., N.Y.C., and Allegheny Ludlum Steel Corp. have announced plans for a 67% expansion of sponge production at the jointly owned Titanium Metals Corp. of America at Henderson, Nevada. The new titanium capacity is expected to come on stream in the latter part of 1956 and will raise the output of the plant from 3600 to 6000 tons per year. Ingot-melting facilities will be expanded to meet the additional production.

LINK-BELT EXPANDS MANUFACTURING FACILITIES

A $3,500,000 expansion program has been announced by Link-Belt Co. for a new foundry and manufacturing facilities at its Ewart Plant in Indianapolis.

After completion of the new foundry next year, the present foundry will be raized and replaced with new manufacturing facilities.

PETERSON TO HOMMEL

Elliott Peterson has been appointed to the sales and service staff of O. Hommel Co., Pittsburgh, announced Ernest M. Hommel, president.

A.I.M. AWARD TO DIVERSEY

The American Institute of Management has awarded the Diversey Corp., Chicago, an Award for Excellent Management.

CURLEY SEES STRONG DEMAND FOR STAINLESS STEEL

John M. Curley, chairman and president, Eastern Stainless Steel Corp., has announced a favorable outlook for the stainless steel industry, based on continued heavy demand for the various grades of stainless from a wide range of industries.

LINK-BELT NAMES WHINREY VICE PRESIDENT

Richard E. Whinrey, general manager of Link-Belt Co.'s Ewart plant in Indianapolis, Ind., has been elected a vice president of the company, announced Robert C. Becherer, president.

Whinrey has been with Link-Belt since 1925.

R. E. WHINREY

EDWARD HAWORTH

CINCINNATI CLEANING NAMES HAWORTH SALES ENGR.

The Cincinnati Cleaning & Finishing Machinery Co., Cincinnati, Ohio, has announced the appointment of Edward Haworth as district engineer for Chicago, northern Illinois and northern Indiana.

BOHN MOVES BETZ PLANT

S. D. Den Uyl, president, Bohn Aluminum & Brass Corp., announces that operations of the Betz Div. will be moved to Danville, Ill.

BLOCK HEADS INLAND STEEL SUBSIDIARIES

The Inland Steel Co. has announced that following the retirement of Clarence B. Randall as chairman of the parent company and subsidiaries, Joseph L. Block, president of Inland Steel, became chairman of Joseph T. Ryerson & Son, Inc., and Inland Steel Products Co., wholly-owned subsidiaries, and of Inland Steel Container Co., a division.

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STANDARD AND SPECIAL PURPOSE FASTENERS

for RANGES • REFRIGERATORS • WASHERS
FREEZERS • DRYERS • HEATING AND
AIR CONDITIONING EQUIPMENT

NATIONAL LOCK COMPANY
Rockford, Illinois

***Lithium award winners** line up with Foote Mineral Co. officials as announcement was made recently of the 1955 awards. Left to right are first place co-winner E. J. Smoke, Rutgers University; J. D. Clark, Award Program Chairman; Research V. P. S. C. Osburn, Jr.; H. J. Lauchner, University of Illinois; first place co-winner B. H. Eichbaum, Rutgers; and Dr. Paul A. Huppert of Keasbey Corporation, who won second prize in the professional category.*

U. S. STEEL MODERNIZATION & EXPANSION PLANS

United States Steel Corp. has announced details of its replacement, modernization and expansion program for plants in Gary, Ind., and in South Chicago, Ill.

Plans are to increase the annual steelmaking capacity of the Gary Steel Works by more than 700,000 tons and the capacity of the South Works at South Chicago by more than 500,000 tons.

Roger M. Blough, chairman of the board, announced that the program for the Chicago district also contemplates the installation of new production facilities at the Gary Sheet and Tin Mill.

The corporation has also developed plans for a new mill at South Works for the rolling of structural sections.

BLACK IS ACME STEEL SALES TRAINING MANAGER

Donald E. Black has been named sales training manager for Acme Steel Co., Chicago, announced G. Findley Griffiths, vice president of sales. Black was formerly manager of the customer service department.

S. L. INGERSOLL HEADS INGERSOLL STEEL DIV.

Election of Stephen L. Ingersoll as president and general manager of the Ingersoll Steel Div., Borg-Warner Corp., New Castle, Ind., has been announced. He succeeds H. G. Ingersoll, retired.

Stephen Ingersoll was formerly executive vice president. H. G. Ingersoll is a vice president and director of Borg-Warner.

ILL. TOOL UPS POUPITCH

O. Jules Poupitch has been named head of a new development program at Illinois Tool Works, Chicago, announced E. W. Fuller, vice president.

FLENNER IS INGERSOLL PRODUCT MANAGER

Appointment of S. E. Flenner as product manager, washing machine parts, has been announced by Ingersoll Products Div., Borg-Warner Corp., Chicago.

WIREBOUND BOX '55 FIGURES; NEW OFFICERS ELECTED

More wirebound boxes and crates were used for shipping industrial products and fresh and frozen foods in 1955 than in any previous year, reports the Wirebound Box Manufacturers Association.

Unit sales for the year totaled 194,986,265 boxes and crates, and the dollar volume for the industry was $112,162,973, also a new high record, L. S. Beale, secretary, reports.

John R. Miller, Jr., T. R. Miller Mill Co., Brewton, Ala., has been elected president of the association, and Neil A. Fowler, General Box Co., Des Plaines, Ill., has been elected vice president.

New directors are George W. Thompson, Indianapolis Wire Bound Box Co.; K. P. Lane, David M. Lea and Co.; and Wallace J. Pierpont, Pierpont Mfg. Co.

COSDEN PAINT LAB.

The Cosden Paint Co., Beverly, N. J., has finished construction on a 2700 foot research laboratory, according to Robert B. Cosden, partner.

BENSON TO PEI STAFF

Donald L. Benson has joined the staff of the Porcelain Enamel Institute as assistant to Wm. N. Brinker, market development manager, announced John C. Oliver, managing director.

OHIO ELECTRIC BUYS KINGSTON-CONLEY

The Ohio Electric Mfg. Co., Cleveland, has announced the acquisition of Kingston-Conley, Inc., North Plainfield, N.J., manufacturers of electric motors and other rotating electrical apparatus.

Ohio Electric and associated companies are H. P. Townsend Mfg. Co., Cleveland Tapping Machine Co., and The Blank Burner Co.

INLAND STEEL EXPANSION

Clarence B. Randall, chairman, and Joseph L. Block, president, have reported that Inland Steel Co.'s expenditures for expansion and improvements, which were at a record level of $46,000,000 in 1955, will be up to $75,000,000 in 1956.

GOODYEAR TIRE & RUBBER APPT.

It is reported that R. B. Warren has been appointed sales manager, Industrial Products Div., Goodyear Tire & Rubber Co., Akron, Ohio.

PREMIER EXPANSION AND PERSONNEL CHANGES

Gordon L. Bowman, sales manager, Premier Co., St. Paul, Minn., has announced the construction of a 6,000 sq. ft. addition to the company's main plant, resulting in a 100% increase in manufacturing area.

C. A. Halverson, Jr., treasurer, has been elected to the board of directors. Charles M. Cassidy, former plant superintendent, has been named chief engineer, and Warren J. Nelson has been promoted to production manager.

ELLIOTT IS ILL. TECH TRUSTEE

Frank F. Elliott, president of Crane Co., has begun a term as a trustee of the Illinois Institute of Technology at Chicago.

GENERAL GAS DIRECTOR

Kenneth H. Gayle, Jr., president of Delta Tank Mfg. Co., Inc., has been elected a director of General Gas Corp.

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Electroplated GOLD FINISH

Cost of electroplating gold is fully in line with your other production costs — yet brilliant tarnish-proof gold adds permanent richness and intrinsic value you can achieve no other way.

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Technic Inc. equips you with controlled apparatus and electroplating solutions to maintain exacting standards and close tolerances. We design and install your equipment for electroplating gold without waste — and our engineers stand by until performance is assured. Consult us without obligation, whether in respect to a new installation or an existing system now in use.

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INDUSTRIAL GOLD has unique and diverse properties — physical, thermal, chemical, electrical, optical, corrosion resistant — not found in combination in any other form. One of these properties — or a combination — may do a hitherto "impossible" job for you, or economically replace steps in your present operation. Write for data sheet: "Electroplated Gold"

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TECHNIC, INC.

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Chicago Office — 7001 North Clark Street

THE LARGEST ENTERPRISE OF ITS KIND IN THE WORLD

NEW PEI MEMBERS

The following companies have become members of the Porcelain Enamel Institute since December 1, 1955: National Metal Products Co., Porcelain Metals Div., Carnegie, Pa.; Vikon Tile Corp., Washington, N.J.; Foote Mineral Co., Philadelphia; S.I.L.T.A.L., Milano, Italy; Claude Neon Industries, Ltd., Australia; A. K. Glud & Marstrands Fabriker, Denmark; and Metal Porcelains Ltd., England.

Total membership in the institute is 148.

FERRO NAMES COLIN MGR. OF METHODS & PROCEDURES

The appointment of Donald R. Conlin to manager of methods and procedures has been announced by George E. Weber, treasurer, Ferro Corp., Cleveland.

Conlin was formerly supervisor of cost accounting.

TRANE EXPANSION

D. C. Minard, president, Trane Co., La Crosse, Wis., has announced the construction of a 24,000 square foot addition to compressor plant 6.

NEW HERCULES POWDER PLANT

Hercules Powder Co., Wilmington, Del., has announced plans for the construction of a new plant in Louisiana, Mo., to produce 7,000,000 gallons of methanol a year.

PENNSALT UPS WILSON

Joseph J. Duffy, sales manager, Pennsylvania Salt Mfg. Co., Philadelphia, has announced the appointment of Bruce W. Wilson to sales supervisor of steel and tin mill accounts.

NATIONAL LEAD EXPANSION

National Lead Co., N.Y., has announced a 25% expansion in the capacity of its ilmenite (titanium-bearing ore) mine and mill at Tahawus, N.Y.

METAL & THERMIT APPT.

It is reported that Donald V. Van Gordon has been appointed supervisor, ceramic sales, for Metal & Thermit Corp., New York.

BENJAMIN ELECTRIC VP

George A. Hamm, formerly controller, has been appointed vice president in charge of finance and secretary for Benjamin Electric Mfg. Co., Des Plaines, Ill.

ROASTING *NOW* AUTOMATICALLY CONTROLLED

ANOTHER NEW KS DEVELOPMENT

Last year, the K-S Electric Meat Thermometer made news by outmoding the stoop, squint and guess routine for roasting. Its indicator, in full view on your range instrument panel, gives the cook reliable information on the progress of the roasting cycle until it is finished to a "turn", fit for the most discriminating epicure.

Something New has been added—AUTOMATION

When the roast or fowl goes into the oven, the cook sets a pointer on the instrument to exactly the degree of doneness she desires. As roasting proceeds, a second pointer moves up indicating the progress of the roasting cycle.

When this indicating pointer reaches the set point, a signal notifies the cook. In addition, if you desire, it will turn off the oven. Thus the cook can devote her full attention to other matters without jeopardizing the perfection of her main dish.

Consider for yourself the value and sales appeal of this new K-S development. Include it in your range.

7501

KING-SEELEY CORPORATION
ANN ARBOR, MICHIGAN

KS

75TH YEAR

CHICAGO MILL *helps* FOSTER deliver safely

FOSTER ALL ALUMINUM REFRIGERATORS AT CRATING DEPARTMENT IN HUDSON, N.Y.

Foster Refrigerator Corp., the leading manufacturer of all aluminum refrigerators and freezers, depends on Chicago Mill and Lumber Company to provide safe shipment for their finished products. These boxes are National Safe Transit tested.

If you are having difficulty in solving a troublesome shipping problem, call in a Chicago Mill representative. Technical information, packing information, and testing services are available without obligation.

Wirebound
Nailed or Hinge Corner
Cleated Plywood
Cleated Craveneer
Cleated Corrugated
Watkins Type Containers
Shop and Tote Boxes
Woodsteel Nesting Boxes

★

FOR DOMESTIC OR EXPORT FOR PEACE OR DEFENSE

A shipping container for every shipping purpose

FOR SAFER TRANSIT BY • TRUCK • BOAT • TRAIN • PLANE

CHICAGO MILL AND LUMBER COMPANY

33 South Clark Street **Chicago 3, Illinois**

Plants at: Helena, Arkansas • Greenville, Mississippi • Rockmart, Georgia
Tallulah, Louisiana • South Fork, Colorado • Chicago, Illinois

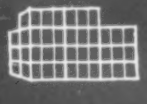
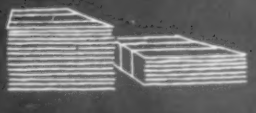
May · 1956

sale transit

FROM ASSEMBLY LINE TO FINAL CUSTOMER

more Wirebounds used in 1955 than any previous year!

BECAUSE WIREBOUND BOXES AND CRATES

STACK BETTER  STORE BETTER 

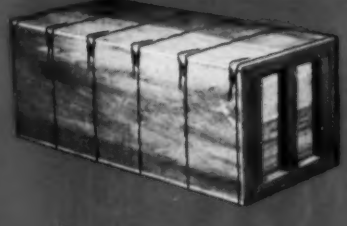
AND HANDLE BETTER INSIDE OR OUT

IN ANY KIND OF WEATHER NOTHING

TOO BIG ...NOTHING TOO HEAVY

NOTHING

TOO DIFFICULT, ALL AT A LOWER TOTAL COST!



INVESTIGATE WIREBOUNDS NOW!

Write on your letterhead for:

- ☐ A Sales Engineer To Call
- ☐ What To Expect From Wirebounds (booklet of general application) and/or Booklets of Specific Wirebound Application To
  - ☐ Materials Handling ☐ Stacking and Warehousing
  - ☐ Packing and Handling Heavy Loads

WIREBOUND BOX MANUFACTURERS ASSOCIATION

May, 1956

safe transit

editorial voice of the national safe transit program

devoted to improving packaging methods and shipping and materials handling methods for the appliance and metal products manufacturing industries. This section contains plant experience information and industry advances for the use of all executives and plant men interested in improving packaging and shipping methods and in loss prevention. The section contains complete information on the national safe transit pre-shipment testing program for packaged finished products and detailed reports of divisions and sub-committees of the National Safe Transit Committee.

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DANA CHASE PUBLICATIONS
York Street at Park Avenue
Elmhurst, Illinois

published monthly as special section of finish — the magazine of appliance and metal products manufacturing

Pre-testing results in $234,000 annual savings for O. A. Sutton

• Wichita manufacturer reports great drop in shipping damage complaints. • Quality control director reports daily double check routine. • Pre-testing each model eliminates weak points before production.

THE importance of carefully laid out procedures for pre-testing products and their shipping containers as one unit has more than proved out for the O. A. Sutton Corp. of Wichita, Kan. Not only have savings in packaging materials been marked — a result of their pre-testing — but the discovery of certain product weaknesses has brought them a wealth of savings that cannot be tabulated in dollars and cents.

Details on Sutton's operation

Manufacturing the well known Vornado fans and air conditioners as well as air conditioners for three large distributors under private brand names, the company shipped 70% of their 1955 production under the National Safe Transit Label. They have been a part of the National Safe Transit Program since August 1, 1954.

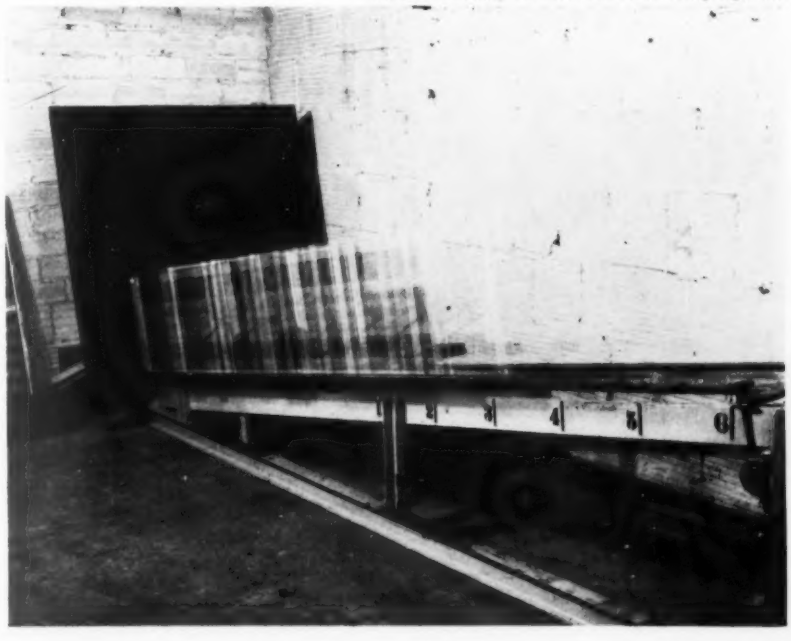
The company was encouraged to participate in that program by a box company which had earlier been certified as one of the National Safe Transit laboratories. Robert Love of the Love Box Co., Inc., Wichita, Kan., is highly enthusiastic about the program and Sutton's success. He says, "We believe sincerely (that) with the safe transit program, O. A. Sutton has done a job that many other companies, buy using the results of the testing intelligently, could also do."

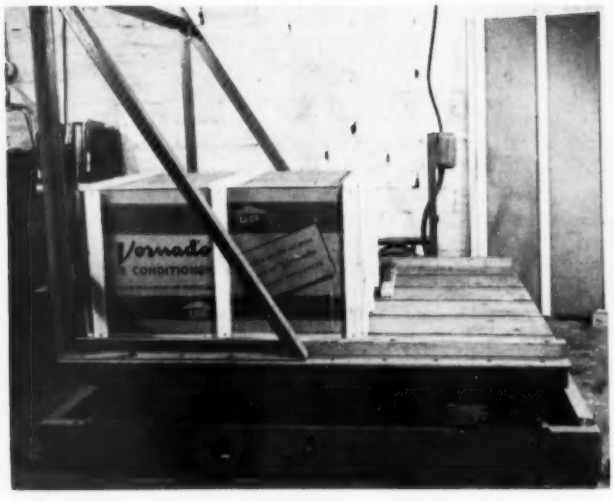
Sutton, as a direct result of the program, was able to reduce the material cost of shipping containers $234,000 for the 12-month period ending last August 1st. Moreover, while reducing packaging costs, they also realized a reduction in shipping damage complaints, with this dropping to a negligible percentage.

Assists quality control

The role of pre-shipment testing in Sutton's quality control program is well stated by Robert Cordes, director of quality control. Say Cordes, "Every day, a minimum of one air-conditioner per line is given a one hour shake test and a 5th zone impact on four sides and bottom. Many times, this rate of test

Photos: courtesy of the Love Box Company, Inc.





PRE-TESTING CONTINUED

is increased to two air-conditioners per line per day.

Testing pre-production models

"Fans are tested at the rate of at least one fan per model run per day. The National Safe Transit test is made prior to 'quality evaluation' tear down of the unit. We have found that this test has pointed out to us all of the shipping problems that would have been encountered. And, whenever defects are noted as a result of the test, immediate corrective action is taken because of our confidence in the test results.

"Whenever a new model is designed, as many as ten units are tested to determine any and all changes necessary before the start of the full operation. We consider the NST test a 'quality control tool' for evaluating engineering and production problems that will be encountered in normal shipment," Cordes asserts.

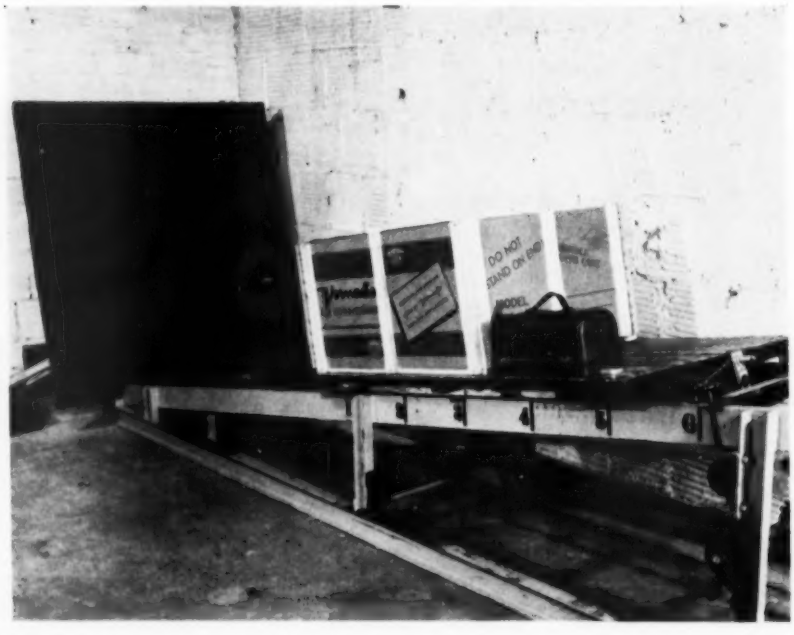
How well this philosophy has panned out is explained by L. W. Schmucker, project engineer for Sutton. "A great value of pre-shipment tests," Schmucker says, "is the elimination of weak points in the construction of new models. On one new model, for instance, we found that during pre-shipment tests the blower wheel became out of balance. This would produce unwanted vibrations.

"Without pre-shipment testing this defect could not have been discovered for several months and would have required the replacement of several thousand blower wheels. Thus, we were able to correct this defect at the very start of production," Schmucker points out.

Such an example as this needs no "dollars and cents" savings to point out the value of pre-testing. The time and customer satisfaction factors alone more than paid for this particular case, notwithstanding the cost of the blower wheel replacement.

Schmucker points out another problem that was revealed by pre-testing. Says Schmucker, "On one occasion the breakage of plastic decorative fronts was traced to a wood brace within the shipping container. The purpose of this brace was to protect the decorative front. However, by careful observation during the Conbur test, it was noted that the wood brace came in contact with the decorative front causing breakage in spite of the spacing provided."

The care with which their product package is engineered is illustrated well by Schmucker when he points out, "For some models of fans, over 10 styles and types of containers are submitted and tested before final acceptance." The ability to ascertain the proper and best — as well as most economical — package could not have been possible, Schmucker points out, were it not for NST's reliable method of pre-shipment testing.



Ed. Note: Readers desiring more information and/or details on each test procedure as detailed in this article should write to the materials handling editor at *finish*.

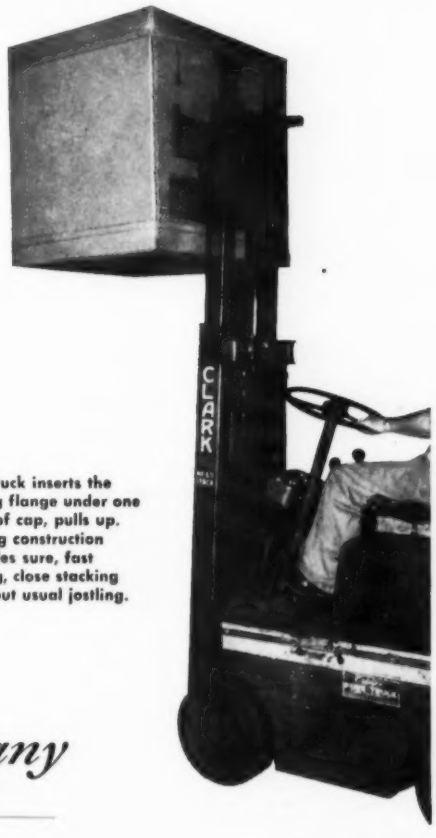
Here's why *Caloric* uses International shipping containers

Easy to handle... Provides safe transit!

- Carton is designed for fast, easy assembly—cuts shipping room time.
- Special tube and cap design enables lift truck to handle easily.
- Interlocking flange cap provides grip for manual handling, necessary for large containers.
- Container can be opened without damage to contents, reclosed for further shipment.
- Dustproof construction assures factory-fresh arrival.
- Large, clean surfaces allow product identification and advertising.

If you have a problem in container design, write us for full details of our custom design service.

Cutaway container with top lifted. The all-corrugated packaging assures safe transit.



Lift truck inserts the lifting flange under one side of cap, pulls up. Strong construction enables sure, fast lifting, close stacking without usual jostling.

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CONTAINER DIVISION
220 East 42nd Street, New York 17, N. Y.

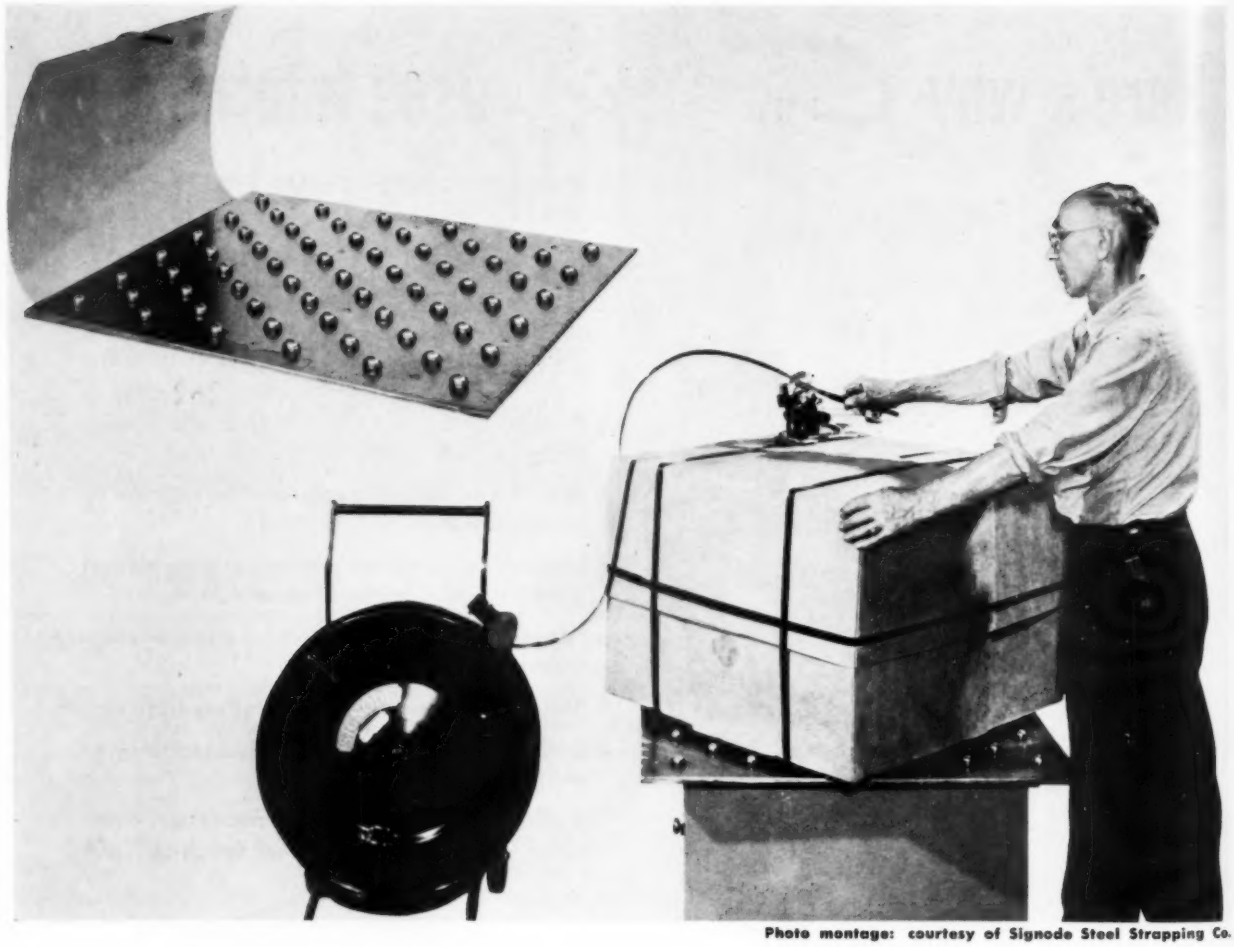


Photo montage: courtesy of Signode Steel Strapping Co.

Ball bearing table top simplifies heavy carton strapping operations

device promises an increased safety factor in packaging heavy containers — one position handling set-up speeds pack and wrap-up operation. Unit designed for mobility.

SIXTY-ONE ball bearings mounted free flowing atop a 36″ square sheet of metal clad plywood are providing new simplicity in packaging operations, especially for those appliance and metal products manufacturers who are manually strapping up heavier units.

The ball bearing table top unit — a system now used extensively for handling sheet steel for press feeding* — eliminates the need for struggling to turn the package. It wheels around to a new position easily at the touch — with the operator able to handle all operations from one position. With the free space under the unit, entry of strapping is easily accomplished with no lifting required, and the ball bearings aid in immediate and exact strap locating.

The valuable safety factor of the unit is easily ascertained by just a glance at the unit. The eliminating of "need to lift" cancels out the possibility of strain due to manhandling the package for a right angle turn.

Economies of using such a table, or series of tables, is that — set up and inserted as part of a conveyor line — packing and strapping operations could be materially speeded up and after time study, a smooth flow through the section maintained.

THE table's use is not limited to just the strapping section. In those cases where a series of components must be snug-fitted into a larger container, the use of a ball-bearing table top would here materially speed up this operation — eliminating the need for stretching on the part of the packer, as well as providing for better packaging and positioning control.

The unit observed by *finish* editors — believed to be the standard size now offered — was sturdily constructed of metal clad haskelite. The ball casters were approximately 1″ in diameter, with the bearing extending some ¾″ above the table surface mounted in a staggered pattern on 3″ centers. Weight of the unit was 37 pounds. An additional fixture — offered with the unit for use when the table is part of strapping operations — serves as a guide and was designed to eliminate need for reaching out for strap ends. Additional details on the use of the unit are available, by request, from the editors.

* A case in point — the A. O. Smith plant at Kankakee, Ill.

Best Way to Better Shipping . . . Engineered Containers by General Box

If you must keep shipping costs and shipping department costs down, yet see that shipments go out on time, packed to arrive at destination in perfect condition, let General Box help you.

General maintains design and testing facilities unmatched in the industry, staffed by design engineers with specialized experience. A General-engineered container for your product will provide maximum protection with minimum weight, go together fast, and be easy to pack. Time and labor costs in the shipping department are reduced, shipping costs are kept low, and damage is reduced or eliminated.

General's modern production methods and rigid quality control keep container costs at a minimum, yet assure the precision that means both easy assembly and maximum strength. Eleven strategically located plants to serve you.

General Box will be glad to work with you to improve your shipping and cut your costs. No obligation. Write for complete information. Send for a free copy of illustrated informative booklet, "The General Box."

Factories: Cincinnati; Denville, N. J.; East St. Louis; Detroit; Kansas City; Louisville; Milwaukee; Sheboygan; Winchendon, Mass.; General Box Company of Mississippi, Meridian, Miss.; Continental Box Company, Inc., Houston.

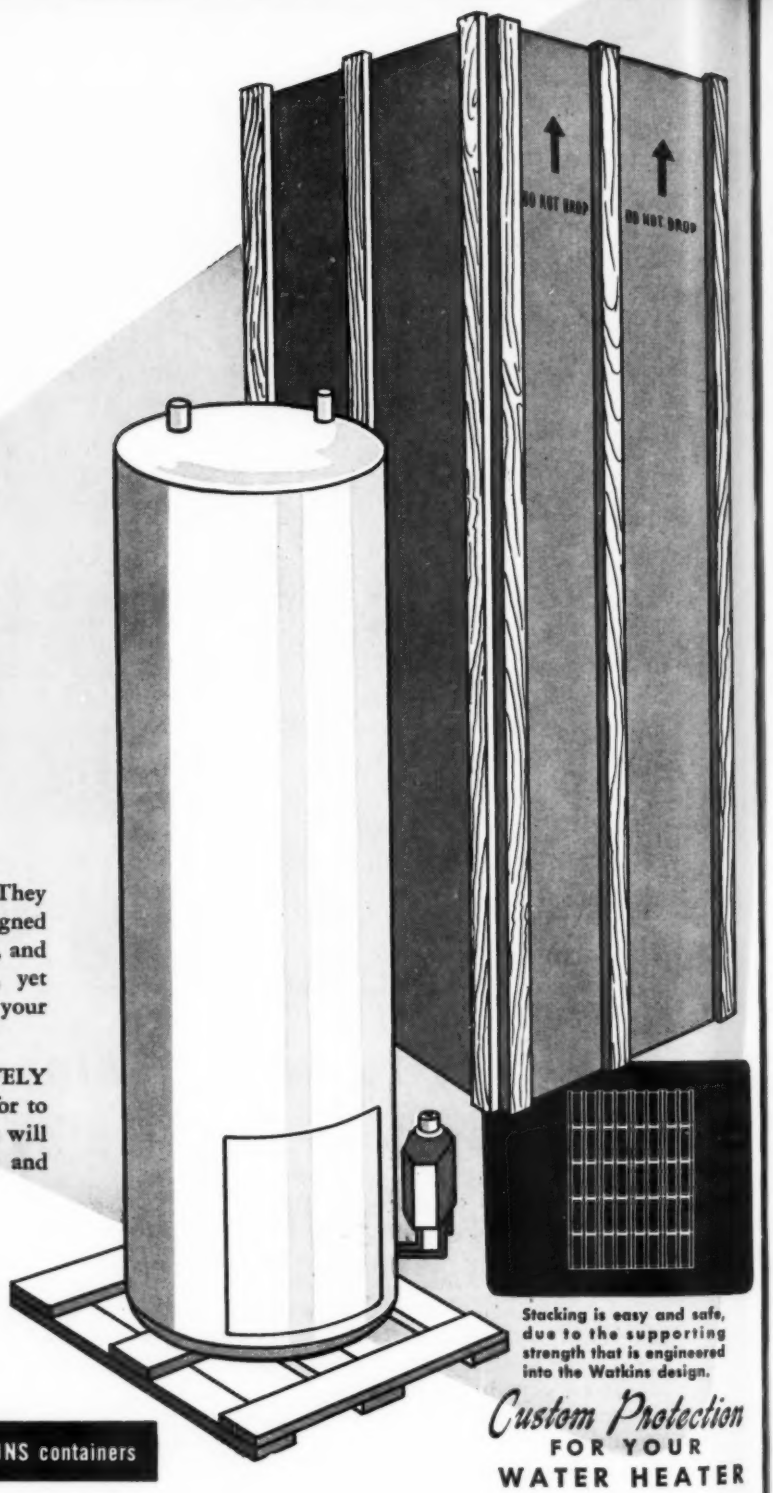
Engineered Containers for Every Shipping Need

• Wirebound Crates and Boxes • Generalift Pallet Boxes • Corrugated Fiber Boxes • Cleated Corrugated and Watkins-Type Boxes • Stitched Panel Crates • All-bound Boxes

General Box

1823 Miner Street, Des Plaines, Illinois

WATKINS has the container for your shipping problem



Stacking is easy and safe, due to the supporting strength that is engineered into the Watkins design.

Watkins Containers will cut your shipping costs. They are delivered to your factory 75% assembled and designed for quick and easy completion, to save you labor, time, and expense. Scientific design gives maximum strength, yet keeps container weight at a minimum and reduces your shipping costs.

In a Watkins Container your product is COMPLETELY protected enclosed 100% by a smooth, staple-free interior to safeguard fine finishes and to keep out dust and dirt. It will carry safely, you can stack to any practical height, and resistance to "weaving" and shock is assured.

Only Watkins Containers provide all of these many desirable and necessary features and at no greater cost than other types of containers. Ship your carefully manufactured products safely and economically—ship them the "Watkins Way."

Custom Protection FOR YOUR WATER HEATER

these companies build WATKINS containers

Cozier Container Corp. ..... 446 East 131st Street, Cleveland, Ohio
Crate-Rite Mfg. Co. ..... 1015 Orient Street, Oakland 7, California
Dura-Crates, Inc. ..... 940 East Michigan Street, Indianapolis, Indiana
General Box Co. ..... 1825 Miner St. Des Plaines, Illinois and 16th and Maple Sts., Louisville, Kentucky
Homb & Martin Mfg. Co. ..... P. O. Box 108, Murfreesboro, Tennessee
Illinois Box & Crate Co. ..... 811 Center Street, Plainfield, Illinois
Kieckhefer Box & Lumber Co. ..... 1711 West Canal Street, Milwaukee, 3 Wis.
Lane Container Corp. ..... 10212 Denton Road, Dallas, Texas
Lewisburg Container Co. ..... 243 Singer Street, Lewisburg, Ohio
Livingston Wood Manufacturing, Ltd. ..... Tillsonburg, Ontario, Canada
Love Mfg., Inc. ..... 608 South Commerce Street, Wichita, Kansas
Pennsylvania Box & Lumber Co. ..... Terwood Road, Willow Grove, Pa.
Utility Crate Corporation ..... 1985 E. 16th Street ,Los Angeles 21, Calif.

—an inquiry to any of these companies will get prompt attention

The · WATKINS CONTAINER · Manufacturers

now?" The answer to that question, he said, is largely dependent upon how much imagination and work industry representatives are interested in putting into the task ahead.

ALCOA'S FRITZ CLOSE

Close outlined work that has been done by aluminum producers in the interest of the development of metal curtain walls and the use of aluminum in architecture. Referring specifically to Alcoa policy, he stressed *the importance* of advertising, publicity and promotion to the public, *an acceleration* of research and development, and *the development* of business policies which will permit both mills and the fabricator to make money on every installation.

Close referred to the Alcoa building in Pittsburgh as the "largest aluminum laboratory for architectural development."

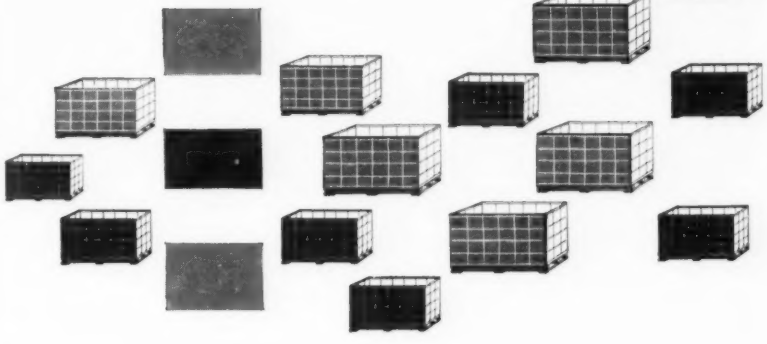
In his remarks, the speaker referred to development work which it was hoped would result in a more economical method of "porcelainizing" aluminum. He also referred to possibilities for future refinements in the anodizing processes.

Mr. Close believes that a good testing program and the carrying out of these points, plus proper education, can "change the face of America." He pointed to the present trend to the elimination of buildings through obsolescence. Any buildings erected from 1910 to 1920 in cities are being torn down and replaced. This is an important sign for the future, he asserted. "The metal curtain wall products must be sold on the basis of merit and not on the demerits of competitors' materials," he pointed out. All these factors combine, he reasoned, to move the metal curtain wall from the "store front" to the multi-story building in a span of 25 years.

our

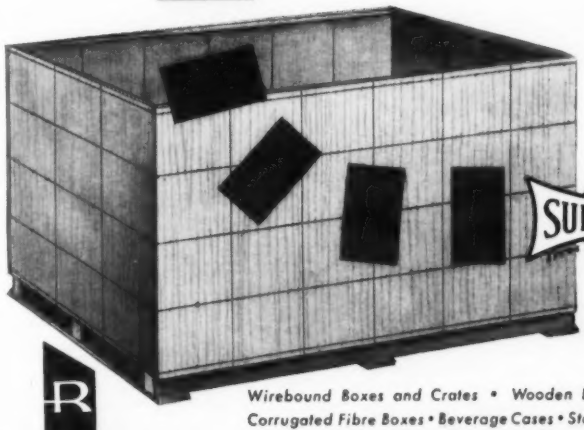
Wirebound Pallet Boxes

are certainly in demand...



Ever since we introduced the SUPERSTRONG Wirebound Pallet Box we have been receiving a heavy volume of orders—and of favorable comments. Seldom has a new product been greeted with such enthusiasm.

The combination of light weight with strength . . . the appreciable reduction in materials handling costs—provide the answer. If you do not know all of the advantages of SUPERSTRONG Wirebound Pallet Boxes, please let us tell you about them.



Wirebound Boxes and Crates • Wooden Boxes and Crates
Corrugated Fibre Boxes • Beverage Cases • Starch Trays • Pallets

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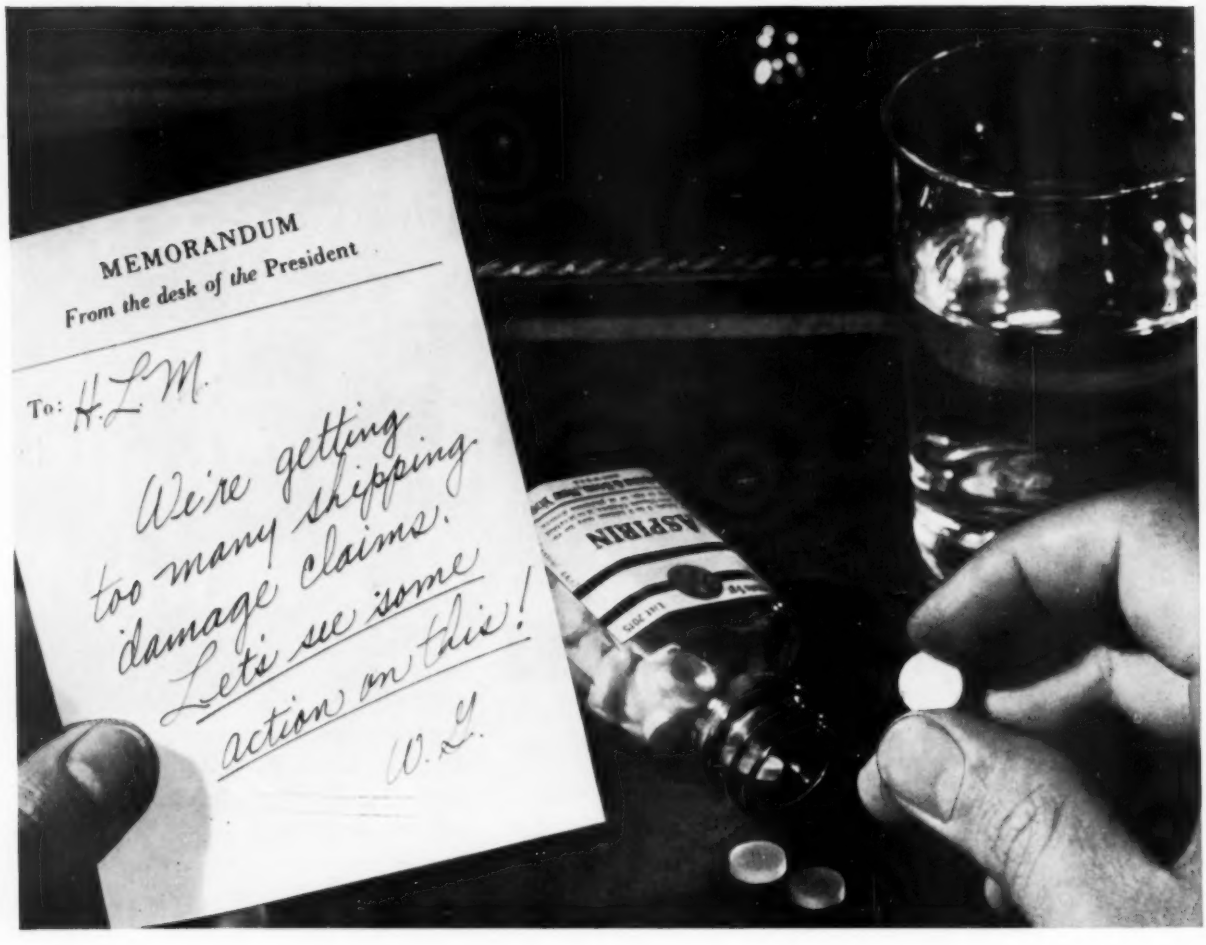
RATHBORNE, HAIR and RIDGWAY BOX CO.

1440 WEST 21st PLACE, CHICAGO 8, ILLINOIS


MEMORANDUM
From the desk of the President
To: H.L.M.
We're getting too many shipping damage claims. Let's see some action on this!
W.L.
ASPIRIN

There's a better way to cure shipping headaches

Action that saves shipping dollars is an Atlas Plywood specialty

If tough shipping problems are *your* headaches, remember this:

Atlas Plywood packaging engineers have come up with exactly the right remedies for many a firm. It's practically certain they can do the same for *you*.

These experts can quickly tell you: (1) whether or not you can get a *safer* shipping container; (2) whether you actually *can* cut your shipping costs; and (3) just *how much* you can save.

This Atlas Plywood service is free and without obligation on your part. Take advantage of it. Find out how you can stop wasting money on preventable product damage and too high shipping costs.

Get our 24-page illustrated booklet, "How Atlas Plywood Cuts Your Shipping Costs . . . Safely." It tells you how Atlas Plywood containers are made, how they're engineered to meet your shipping requirements — and how they earn their lab-tested label in a laboratory equipped with every modern container testing device. For your free copy, see your Atlas Plywood representative (listed in your classified phone directory). Or write to Atlas Plywood Corporation, Dept. F-9, 1432 Statler Building, Boston 16, Massachusetts.

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BOSTON 16, MASS. • DISTRIBUTORS IN ALL PRINCIPAL CITIES

PLYWOOD CONTAINERS • FLUSH DOORS • HARDWOOD PANELS

FROM AMERICAN FOREST TO FINISHED PRODUCT

Bathtub strapping system "Operation Easy" is lesson in packaging economy

A SIMPLE strapping set-up at the Universal-Rundle Corp., Milwaukee, Wisc., has reduced labor needs for one section of the shipping department and greatly simplified the existing job operation. Universal-Rundle, which manufactures — along with other lines — porcelain enameled bath tubs, spent quite a bit of effort to simplify the packaging operation of this rather bulky product.

The tubs are shipped in a special crate, designed to provide maximum protection of the unit with a minimum of packaging material cost. The accompanying photo clearly details out the construction of this package.

Three flat straps of steel are used to lock down the wooden container and hold the tub tightly in its correct position. Formerly, this was a hand operation with the labor of threading and the responsibility for proper tension resting firmly upon the operator's own abilities.

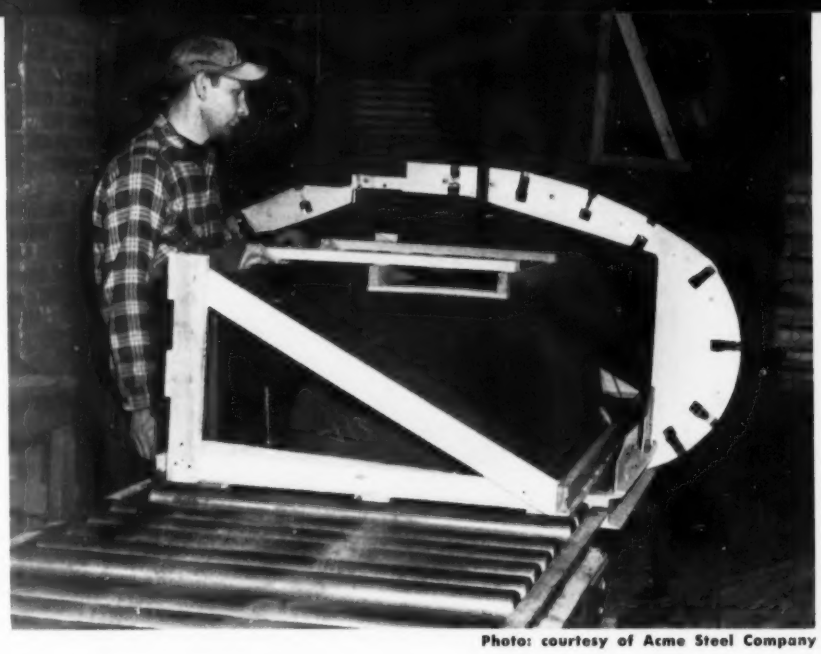
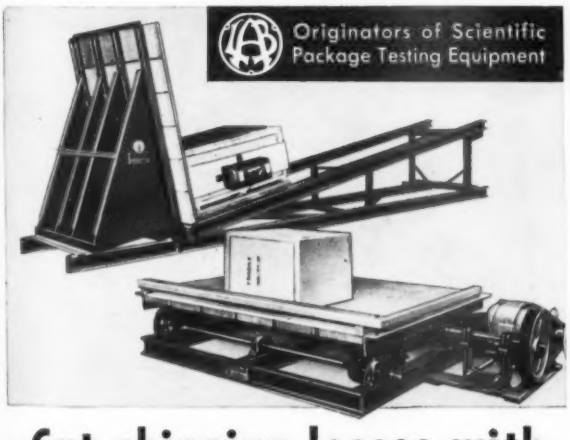


Photo: courtesy of Acme Steel Company

To eliminate this excessive labor cost — as well as provide for more close control of the strap tensioning and, as a result, the proper packaging of each unit — the company installed a semi-automatic strapping machine equipped with a strapping ring which eliminates the need for manual placement of the steel strap. After correct positioning of the crated tub, easily facilitated because of the roller conveyor table, the strapping is placed, tensioned, cut and ended by just a touch of the trip switch. The simplified and improved operation means that now one man can do the same amount of work that was formerly done by two. The successful operation as detailed above has proven itself in a number of other packaging operations with various size and types of products.



Cut shipping losses with L.A.B. Package Testers

We were the original developers of this type of package testing equipment and our machines were used in evolving the test procedures recommended by the National Safe Transit Committee and the American Society for Testing Materials. Only genuine L.A.B. testers are backed by 15 years' experience in the plants of America's leading manufacturers.

We are an NSTC certified laboratory

WIDE RANGE OF TYPES, SIZES OFFERED BY L.A.B.

- Incline-Impact (Conbur) testers – 400-10,000 lb. capacity.
- Vibration testers – 400-10,000 lb. capacity – tables to 8' x 12'
- Drop Testers – packages up to 100 lb.

WRITE FOR CATALOG

L.A.B. Corporation Skaneateles 4, N.Y.

Quality Control
TEST EQUIPMENT

Incline Impact Testers — 1,250# to 10,000# Cap.
Vibration Testers — 100# to 10,000# Cap.
Remote Control Drop Testers

N.S.T. APPROVED

Special Compression, Fatigue, Shock & Shear Testers Designed & Manufactured

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SAFE TRANSIT NEWS

NATIONAL SAFE TRANSIT COMMITTEE

Associations Building, 1145 - 19th St., N. W., Washington 6, D. C.

New Company Certifications - The following companies are the latest certifications under the National Safe Transit Program:

Penn Ventilator Co., Philadelphia, Pennsylvania
Bettcher Mfg. Corp., Cleveland, Ohio
Kreonite Inc., Wichita, Kansas
Diebold, Inc., Canton, Ohio
Westinghouse Electric Corp., Staunton, Virginia

The above manufacturers produce such varied products as roof ventilators, sheet metal products, photographic equipment, bank and office equipment, and air conditioning products.

- - - - -

New Laboratory Certifications - Many certified companies are using the testing facilities of container firms that have installed Safe Transit Laboratories as a service to their customers. Latest certifications under this category are:

Venant Company, Inc., Milwaukee, Wisconsin
Container Corporation of America, California Container Corp. Division, Los Angeles, California
T. R. Miller Mill Company, Inc., Brewton, Alabama
Bathurst Power & Paper Company Limited, St. Laurent, Quebec

- - - - -

NST Policy Group Meets in Cleveland - The Policy Group of the National Safe Transit Committee met recently in an all-day meeting devoted to long range planning for the NST Program. Particular attention was given to expansion of the Program into new areas.

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ATA "Care Cuts Claims" Campaign Underway - April saw the launching of ATA's new "Care Cuts Claims" campaign in trucking terminals throughout the country. The campaign is taking the story of the Safe Transit Label directly to workers on the job. Commenting on NST's participation in the campaign, John M. Miller, Executive Secretary of ATA's National Freight Claim Council, said, "To our knowledge, this is the first time a shipper group and a carrier group have teamed up in a full-scale loss and damage prevention campaign".

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Southern Pacific Company Views Safe Transit Film - Representatives of the Freight Protection, Merchandise, and Station Service, Southern Pacific Company viewed the Safe Transit film in a special showing arranged by Mr. P. M. Chaimov, Manager. Mr. Chaimov also presented the film at a meeting of foremen, supervisors and employees of Sears, Roebuck & Co., Los Angeles.

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Safe Transit Speakers Bureau - Highlighting the activities of the NST Speakers Bureau were recent presentations for the Institute of Packaging, Purdue University, and the Annual Meeting of the Pulp and Paper Industry in New York. Organizations from almost every state were represented at both meetings.

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SIPMHE Meeting - John C. Oliver, Secretary of the NST Committee was guest speaker at the April meeting of the Society of Industrial Packaging and Materials Handling Engineers, Dallas, Texas. The occasion was the official opening of the newly certified Institute of Packaging, located at Southern Methodist University, Dallas, Texas, and organized under the auspices of the Dallas chapter of SIPMHE.

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